

10916
A NEW and ACCURATE
M E T H O D

DELINEATING all PARTS

Of the different

O R D E R S

I N

ARCHITECTURE,

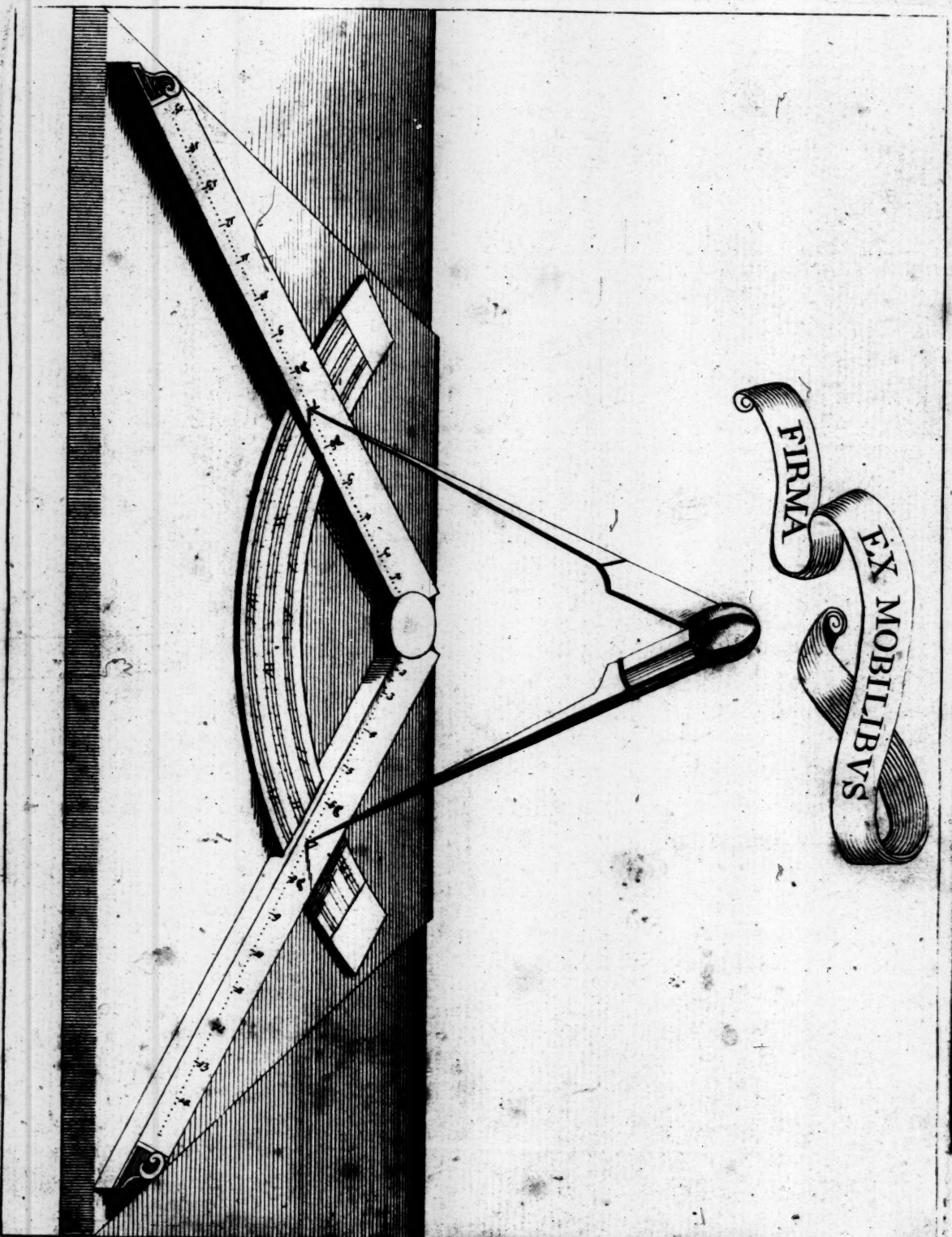
By Means of a well contriv'd, and most easily manag'd

I N S T R U M E N T;

WHEREON THE

Just PROPORTIONS of the Principal MEMBERS,
and of their several PARTS, are so disposed, as wholly to avoid the Difficulty
of the Fractional Parts that usually attend these OPERATIONS.

English'd from the Original ITALIAN of OTTAVIO REYESI BRUTI,
By THOMAS MALIE, Gent.



L O N D O N,

Printed for FLETCHER GYLES over against *Gray's-Inn Holbourn*, and THOMAS HEATH,
Mathematical Instrument Maker, next the *Fountain Tavern* in the *Strand*. MDCCLXXVII.





TO THE

RIGHT HONOURABLE

RICHARD,
EARL of *BURLINGTON.*

MY LORD,

I WOULD not have presumed to publish the following Translation, if Your Lordship, after a careful Perusal, had not been pleased to advise and encourage me to it, in order that the *English* Builders might not lose the Advantage of an Invention so apparently useful; who therefore cannot but gratefully acknowledge it wholly to your Lordship's Generosity and Goodness.

IT

D E D I C A T I O N.

It is not for me even to mention to your Lordship the various Applications of the curious Instrument herein described; your Lordship's Approbation alone, is more than sufficient to engage all Lovers of Architecture to esteem it with the Regard it justly deserves.

It is chiefly owing to your Lordship's superior Taste and Judgment in this Magnificent Art, that so many Attempts have been made of late towards Building Well; which has contributed not a little to the promoting of many useful Works already done, and Designs that are still in View, much for the Benefit of the Publick, and Glory of our Nation.

So that this Treatise, upon all Accounts, claims your Lordship's Patronage; and by that means gives me an opportunity of acknowledging your Lordship's many Favours, and of declaring my self to be, with the utmost Respect,

My LORD,

Your Lordship's

Most obedient and

Most devoted Servant,

THOMAS MALIE.

P R E F A C E

T O T H E

R E A D E R.

AS I have always from a natural Inclination, been greatly delighted with good Architecture, particularly that part, which regards the Ornaments; I have often thought it would be of great Advantage and Use to Persons that would work by just Proportions, especially to those less skilled, if a Method could be found to perform what is required in this noble Art, in a more expeditious Manner than is usually done; and to avoid the many different Calculations, that most commonly prove both tedious and uncertain to those, that are not well acquainted with Arithmetick.

And therefore by often examining this Subject, and by considering how to obviate the Difficulties therein, I have found a much better Method might be obtain'd, and that by Means of a well contriv'd, and most easily manag'd Instrument; whereon the just Proportions of the principal Members, and of their several Parts, are so disposed; as wholly to avoid the Difficulty of the fractional Parts that usually attend these Operations.

The Use of which may soon be understood; and by that means, without any other Instruction, one may, with great Facility, form the five Orders, and find the Quantity of their several Parts, with every particular Ornament belonging to the same; as also thoroughly acquaint himself with all that is necessary to be known in Architecture, so far as relates to the proper and exact Disposition of the Parts of all perfectly fine Buildings, or to the Order, Symmetry, and Beauty of every truly magnificent Structure.

Its Convenience will soon be discovered by all that shall make use of it; for the Proportions of all the Parts are to be found ready formed thereon, with such exactness, as never to fail in any Operation.

I should have been very willing to shew, how the Lines and Scales for each Order are to be divided, and placed upon the Limb of the Instrument; but fearing it would be too difficult to those, who are not

P R E F A C E.

very knowing in the Mathematicks, I thought it much better to shew only the Use of the Instrument, supposing that to be the readiest way to come at the Knowledge thereof.

The two Faces of the Limb, as they are carefully drawn on the Plate annex'd, I judg'd to be sufficient, since by them others may easily be framed of any Magnitude, as seems most convenient; which shall be farther explain'd in the following account of the Fabrick, and Division of this Instrument.

The Instrument is capable of receiving other Scales, not only for Architecture, but also for Geometry, Arithmetick, &c. the manner that it is here done, shews how the like may be applied to many other Uses.

CONTENTS

C O N T E N T S.

O^F the Fabrick and Division of the Instrument,
Of the Division of the Limb of the Instrument,

Page 1
3

Of the Tuscan Order.

Oper. I. To form Colonnades and Arches without Pedestals,	4
Oper. II. To form Colonnades with Pedestals,	5
Oper. III. To form Arches without Pedestals,	6
Oper. IV. To form Arches with Pedestals,	7
Oper. V. To form Tuscan Doors,	8
Oper. VI. To form Niches,	9
Oper. VII. To form the Basements,	10
Oper. VIII. To form the Entablature,	11
Oper. IX. To form the Cornices of Doors,	12

Of the Dorick Order.

Oper. X. To place Doors within Colonnades without Pedestals,	13
Oper. XI. To place Doors within Colonnades with Pedestals,	14
Oper. XII. To place Doors within Arches without Pedestals,	15
Oper. XIII. To place Doors within Arches with Pedestals,	16
Oper. XIV. To place Doors in plain Fronts,	17
Oper. XV. To form Doors proportional to Niches,	18
Oper. XVI. Of Basements,	19
Oper. XVII. An Observation upon the Cornice in this Entablature,	20
Oper. XVIII. By any Cornice to form another greater or less, in one given Proportion	21

Of the Ionick Order.

Oper. XIX. To place Niches within Colonnades without Pedestals,	22
Oper. XX. To place Niches within Colonnades with Pedestals,	23
Oper. XXI. To place Niches within Arches without Pedestals,	24
Oper. XXII. To place Niches within Arches with Pedestals,	25
Oper. XXIII. To place Niches on each side of Doors,	26
Oper. XXIV. To place Niches in plain Fronts,	27
Oper. XXV. A Caution in the following Basements,	28
Oper. XXVI. An Observation upon the Ionick Capital,	29
Oper. XXVII. To form the Orders with their Members as large as you please,	30

Of the Composite Order.

Oper. XXVIII. To measure the Orders,	31
Oper. XXIX. To measure the Orders by another Method,	32
Oper. XXX. To measure the Orders after a more exact manner,	33
Oper. XXXI. A Caution in measuring the Orders,	34
Oper. XXXII. A Caution in measuring the Orders,	35
Oper. XXXIII. A Caution in measuring the Orders,	36
Oper. XXXIV. To vary the Members,	37
Oper. XXXV. An Observation upon the Capital in the Composite Entablature,	38
Oper. XXXVI. To form a Profile with a lesser quantity of Members,	39

CONTENTS.

Of the Corinthian Order.

Oper. XXXVII. To place the Orders the one upon the other,	40
Oper. XXXVIII. To form the Orders by any given Proportions,	41
Oper. XXXIX. To form the Capital to any given Column without a Capital,	42
Oper. XL. To form a proper Column to any given Capital,	43
Oper. XLI. By the Opening or Void, to form a proper Cornice to any given Door,	44
Oper. XLII. To form the proper Ornaments belonging to any given Niche,	45
Oper. XLIII. To know what Proportion the Parts of the Orders have one with another,	46
Oper. XLIV. An Observation upon the Corinthian Capital,	47
Oper. XLV. To proportion the Parts of the Members of the Orders,	48

Of the Ornaments of the Orders.

Oper. XLVI. To flute Columns,	49
Oper. XLVII. To form the Voluta,	50
Oper. XLVIII. To form Scrolls, and apply them to Cornices,	51
Oper. XLIX. To form Balusters or Colonets,	52

Directions to the Bookbinder.

Plate	2	3	to face Page	3	Plate	28	to face Page	29
	2	3	—	4		29	—	30
	3	4	—	5		30	—	31
	4	5	—	6		31	—	32
	5	6	—	7		32	—	33
	6	7	—	8		33	—	34
	7	8	—	9		34	—	35
	8	9	—	10		36	—	37
	9	10	—	11		37	—	38
	10	11	—	12		38	—	39
	11	12	—	13		39	—	40
	12	13	—	14		40	—	41
	13	14	—	15		41	—	42
	14	15	—	16		42	—	43
	15	16	—	17		43	—	44
	16	17	—	18		44	—	46
	17	18	—	19		45	—	47
	18	19	—	20		46	—	48
	19	20	—	21		47	—	49
	20	21	—	22		48	—	50
	21	22	—	23		49	—	51
	22	23	—	24		50	—	52
	23	24	—	25		51	—	
	24	25	—	26			—	
	25	26	—	27			—	
	26	27	—	28			—	

Instrumental Architecture;

O R

A NEW and ACCURATE

METHOD OF

O F

DELINEATING all the PARTS

Of the different

ORDERS

I N

ARCHITECTURE, &c.

Of the Fabrick and Division of the Instrument.

THAT every one may readily comprehend the utility of this Instrument, without going to the immediate expence of having one made of Brass, all its Parts are separately drawn on the Plate annex'd, which may be cut out, and pasted upon Paste-board or Card-paper, to form one after the following manner.

The Legs of the Sector, upon which the Lines of Proportion are divided, must consist of three pieces of Paste-board or Card-paper, pasted the one upon the other, that the Openings, through which the Limb is to pass, may be more conveniently made in the middle one, as also to form the Joint; the one being male, and the other female.

The two Faces of the Limb are to be pasted upon a single piece of Paste-board or Card-paper; one Face upon each side, as opposite as possible.

The Limb being thus made to pass easily through the Openings in the Legs of the Sector, the Instrument will be complete, as it is represented in the Frontispiece, with the Compasses placed as they ought, to take any transversal Space or Distance.

Those made of Brass ought to be well polish'd, the Openings especially, and four Screws fitted to hold the Limb steady to any Point required.

These Screws are not necessary in Instruments made of Paste-board.

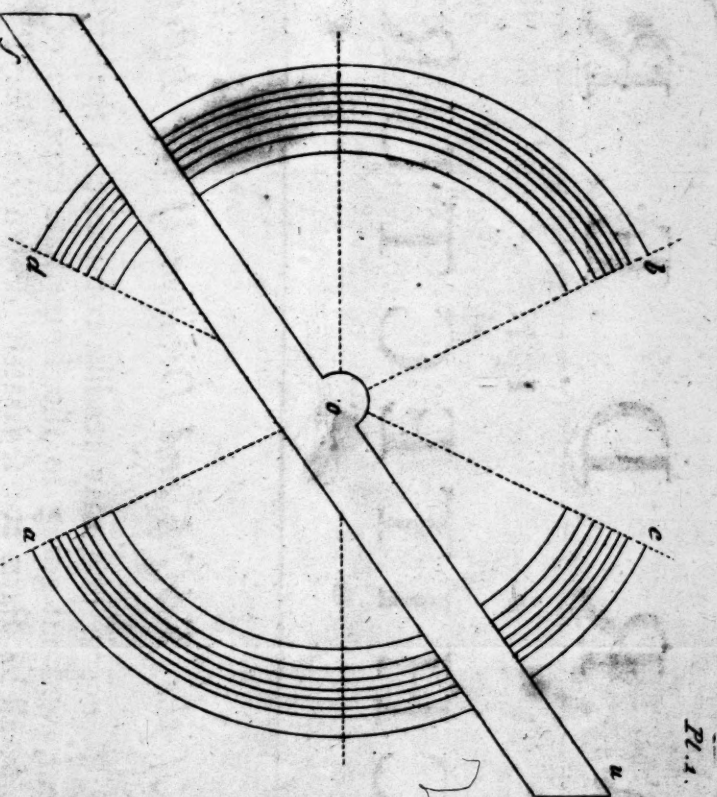
In order to transfer the Lines of this Instrument upon a Brass one, from the Scheme thereof here annexed; take one of the Faces of the Limb of this Paper
B Scheme,

2 INSTRUMENTAL ARCHITECTURE.

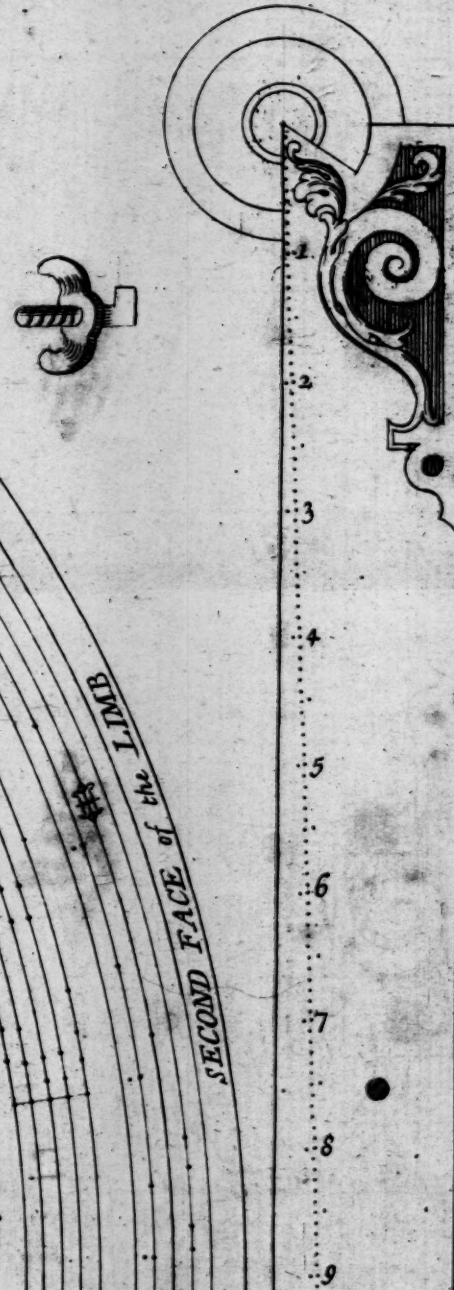
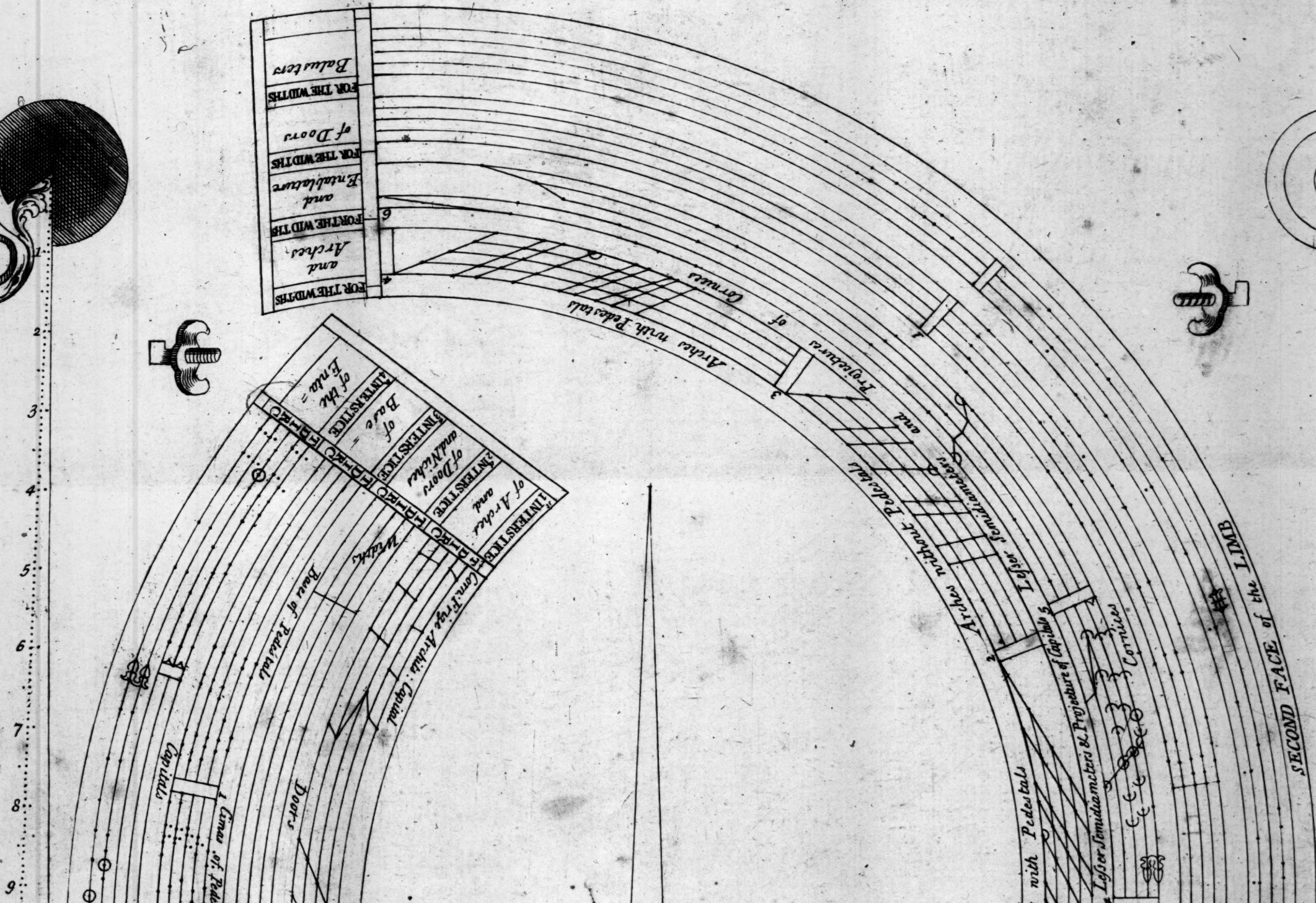
Scheme, paste it upon a Board, as the Part AB, fasten the Brads one opposite, as DE; make O your Center to both. Then take a Pair of Compasses, fix one Point in the Center O, fit the other Point to every Line of the Portion AB, from which countermark the other Face, drawing, or marking the four Interflices with five Lines in each.

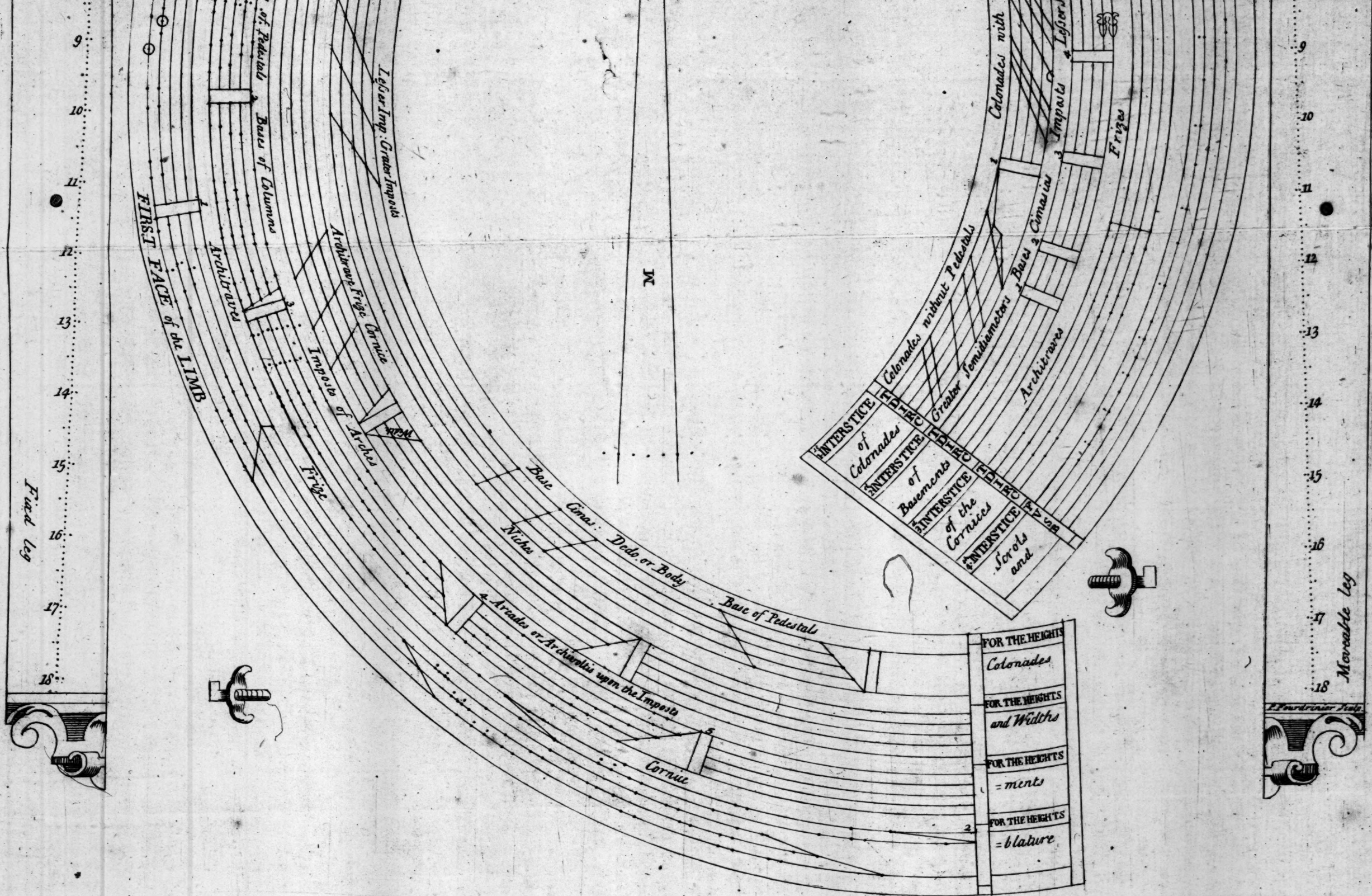
The Lines being thus mark'd, place the edge of a Ruler on the Center O, instead of the Compasses, as VS in the Example, convey it to every Point, or Division in the Part AB, and countermark them upon the correspondent Lines of the opposite Part DE; by which method the Divisions may be mark'd sufficiently exact.

The same is also to be done with the other Face of the Limb, so as to compleat the whole, with its Divisions, &c. exactly answerable to the Original.









Of the Division of the Limb of the Instrument.

BEFORE we come to an Explanation of this Instrument, we must consider, that Designs in Architecture are but Representations, upon a Plane by right Lines chiefly, shewing the exact Disposition of any Work we are about to form, wherein the two Dimensions, Heights, and Widths are only considered. We may therefore properly say, that the drawing of the Orders is only a method of determining certain Heights and Widths proportional to the Parts, or Members that such Orders require.

It is upon that Principal, that this Instrument is established, four Interstices being drawn upon each Face of the Limb, each containing five Lines, answerable to the five Orders of Architecture.

The first Interstice upon the first Face is for the Heights of Colonnades and Arches, and consists of five Lines, each mark'd with a Letter proper to the Order; the first of which is mark'd with *T*, and gives the Heights of *Tuscan* Colonnades and Arches: The second with *D*, for the *Doric*: The third with *I*, for the *Ionick*: The fourth with *R*, for the *Roman* or *Composite*: the fifth and last with *C*, for the *Corinthian*. The second Interstice is divided into two Spaces; the first gives the Heights and Widths of Doors, the second the Heights and Widths of Niches. Every Line of this Interstice is, in the foregoing Manner, mark'd with a proper Letter to distinguish the Order they are for.

The third is divided into five Spaces, for the Heights of the Moldings, or Ornaments of Basements, which comprehends all the Parts that are from the Bases of Pedestals to the Arcade: The first Space in the first Line mark'd with *T*, gives the Heights of the Bases of *Tuscan* Pedestals; the second those of the Cima-sum; the third of the Bases of Columns; the fourth of the Imposts of Arches; the fifth and last of the Arcade or *Archivolts*: The same is observed in the other Lines for the other Orders.

The fourth and last Interstice upon this Face is divided into two Spaces, for the Heights of the whole Entablature, which comprehends the Capitals, and the Cornices upon them: The first Space in the first Line mark'd with *T*, gives the Heights of *Tuscan* Capitals; the second those of the Cornice: The same is also observ'd in the other Lines for the other Orders. These are all the Heights necessary to form the five Orders of Architecture.

The second Face is in the same manner divided into four Interstices, for all the necessary Widths answerable to the foregoing Heights: The first Interstice is divided into four Spaces, for the Widths of Colonnades and Arches: The first Space in the first Line mark'd with *T*, contains the Widths of *Tuscan* Colonnades without Pedestals; the second those of Colonnades with Pedestals; the third, of Arches without Pedestals; the fourth and last, of Arches with Pedestals: The same is observ'd in the other Lines for the other Orders.

The second Interstice gives the Widths of the Members or Parts of Bases and Cornices, being divided into six Spaces; the first of which contains the greater Semidiameters, or half the Thickness of the Foot of the Column; the second the Width or Projecture of the Cima-sum of Pedestals, which serves also for their Bases; the third the Widths of the Bases of Columns; the fourth, of the Impost; the fifth, for the Entablature, contains the lesser Semidiameters, or half the Thickness of the Column at top, and the Projecture of Capitals; the sixth and last gives the lesser Semidiameters, and the Widths or Projectures of Cornices.

The third Interstice is for the Heights of the Moldings or Ornaments of principal Doors. The first Line mark'd with *T*, gives the Heights of the Members of *Tuscan* Doors; the second mark'd with *D*, of the *Doric*, &c.

The first Line of the fourth and last Interstice mark'd *F*, serves to flute the Columns; the second with *V*, for the Volute; the third with *S*, for Scrolls and their Thickness; the fourth with *B*, for Balusters or Colonnettes; the fifth and last having no Divisions mark'd upon it, is left to the discretion of the ingenious Artist, to improve as he shall think proper, according to his Skill in Architecture or Mathematicks.

This is all, as to the Divisions on the Limb, which ought to be well consider'd and understood, having an Instrument for that purpose, or the annex'd Draught, by which all the parts thereon describ'd, may easily be comprehended.

OF THE

TUSCAN ORDER.

OPERATION I.

To form Colonnades and Arches without Pedestals.

TO shew the particular use of this Instrument, we will begin with the *Tuscan* Order, that being first, simplest, and most easy; by the Example of which, any one may readily comprehend how to form the other Orders. My design therefore is to teach in this first Operation, how to form Colonnades, with Columns without Pedestals.

Take the Instrument, fasten the fix'd Leg to the beginning of the first circular Line, in the first Interstice, upon the first Face mark'd with T; open the moveable Leg to that Point only, which marks the end of the Cimaſium of Pedestals, and beginning of the Bases of Columns, *i. e.* to 1, 10 of the perpendicular Line, which represents the first Curve in the Limb. The Instrument being thus set, take the Quantity of the Line AG with a Pair of Compasses (supposing that the Height of the Colonnade) see where it transversally fits upon the Lines of Proportion upon the Legs, we will suppose to 7, 7, and 4, 4, Points; this being examin'd, you must carefully remember these Numbers, as they are to serve throughout the Operation: Slide the moveable Leg to the next Point 9, of the said perpendicular Line; take the transversal Space 7, 7, and 4, 4, and mark the Intersection F, placing one Point of the Compasses at A, which gives the Height of the Bases of the Columns. You must, in the same manner, slide the moveable Leg to 5, 4, 3, 2; and to every Number, take the transversal Space 7, 7, and 4, 4, with which always fix one Point of the Compasses at A, mark the following Intersections E, D, C, B, with parallel Lines, that give all the necessary Heights: Omit 8, 7, 6, as they serve for the Imposts of Arches, which shall be better explain'd hereafter.

For the Widths, fasten the fix'd Leg to the beginning of the first Space, in the first Line of the first Interstice, upon the second Face of the Limb mark'd with T; slide the moveable Leg to the end of the said Space, represented by the horizontal Line 1, 2, 3, 4, 5, 6, 7, 8; when set, take the transversal Space 7, 7, and 4, 4, and mark the Intersection AH; fixing one Point of the Compasses at A, then at G, to mark that of GH, which gives you half the lesser Intercolumnation: Slide the moveable Leg to the next Points 7, 5, 4, 3, 2, take the same transversal Space 7, 7, and 4, 4, to every Point, with which fix one Point of your Compasses at A, then at D, E, F, G, and mark the following Intersections A I, D L, E M, N F, N O, P, these being all the Widths requir'd to form the *Tuscan* Colonnade, with Columns without Pedestals, plain or without Ornament: I shall hereafter teach how the particular Members of each Order are to be placed.

N. B. The Points upon the horizontal Line from 1 to 4, are call'd inferior, and from 4 to 8, superior.

OPERATION

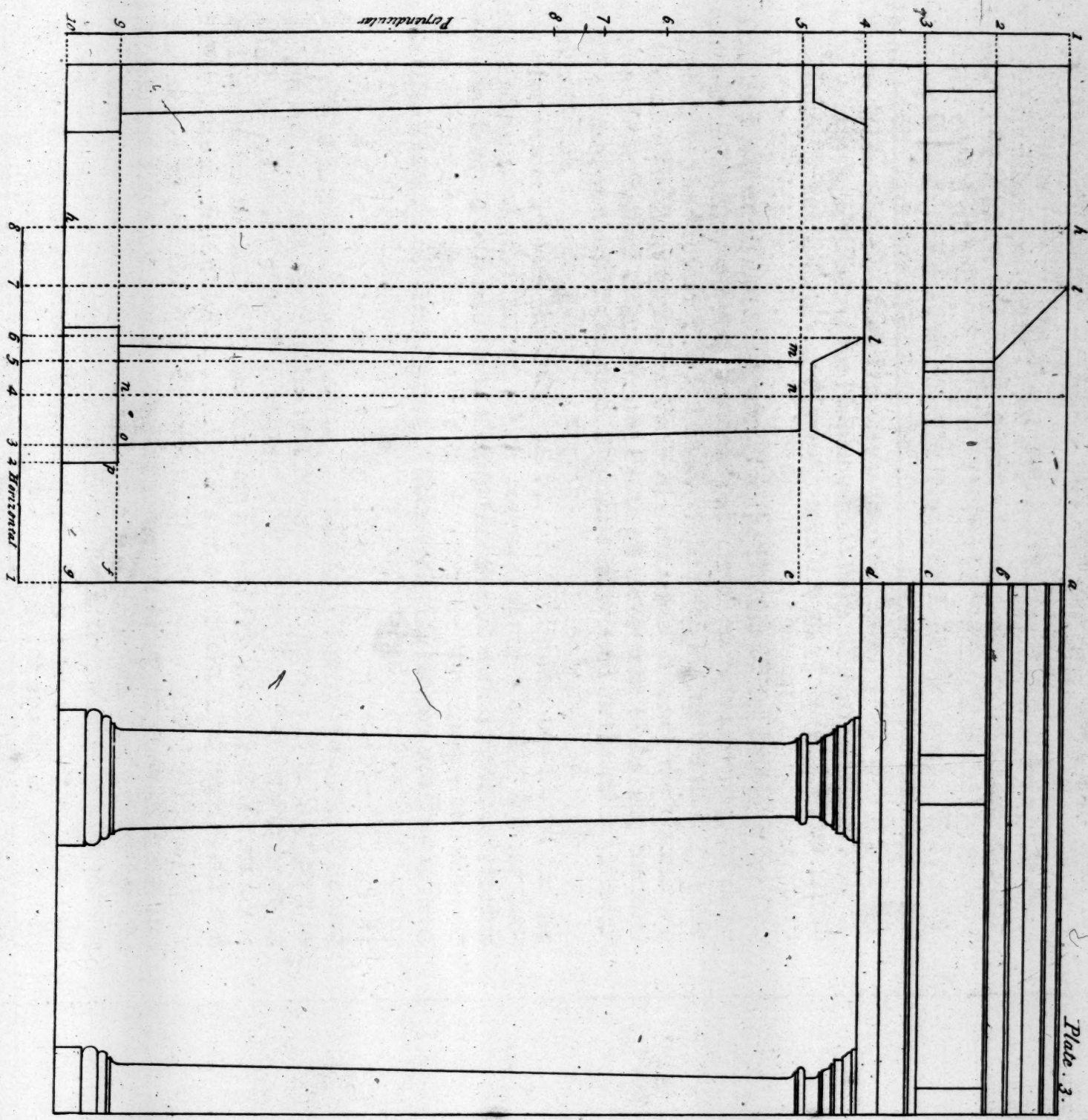
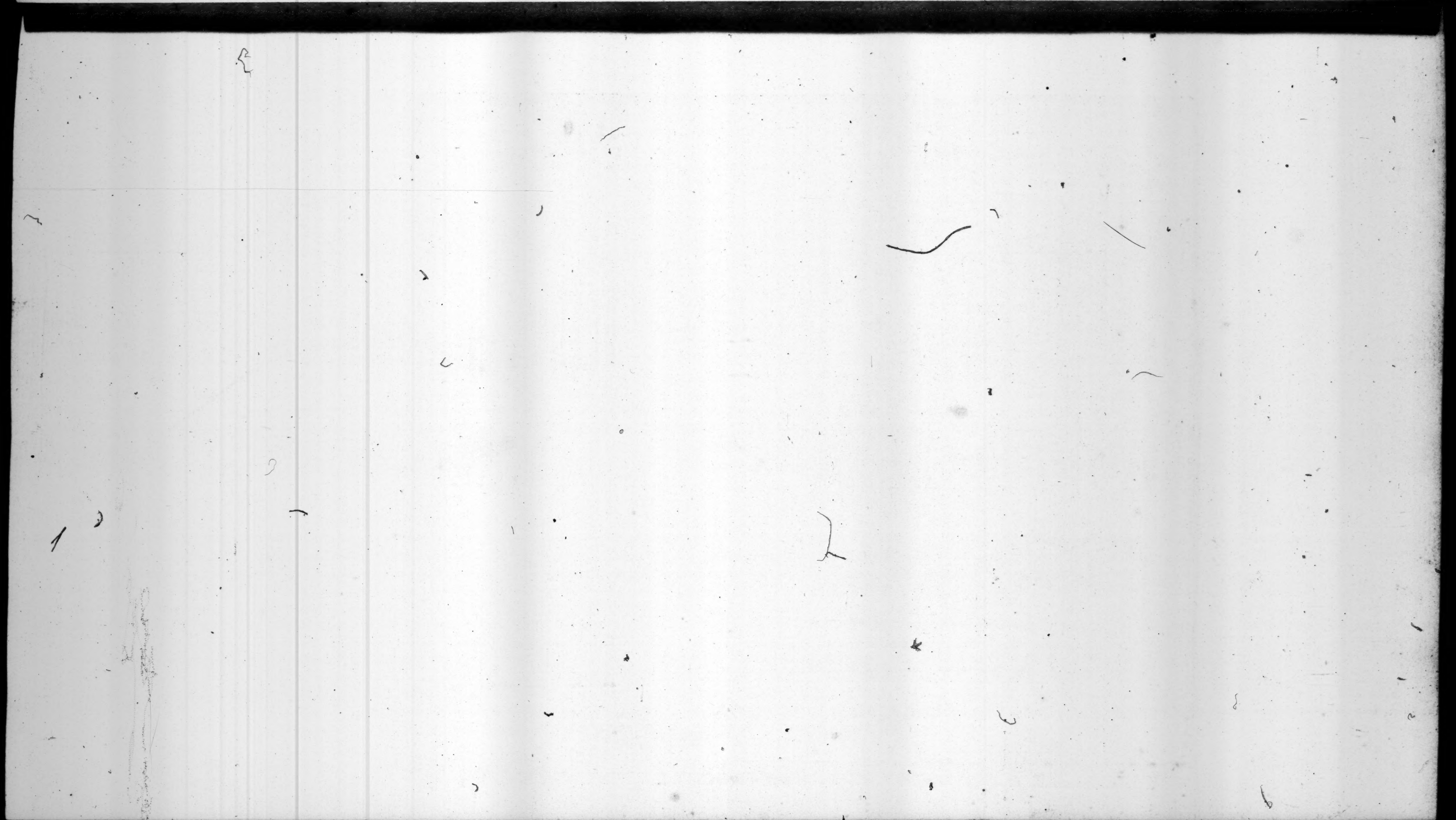
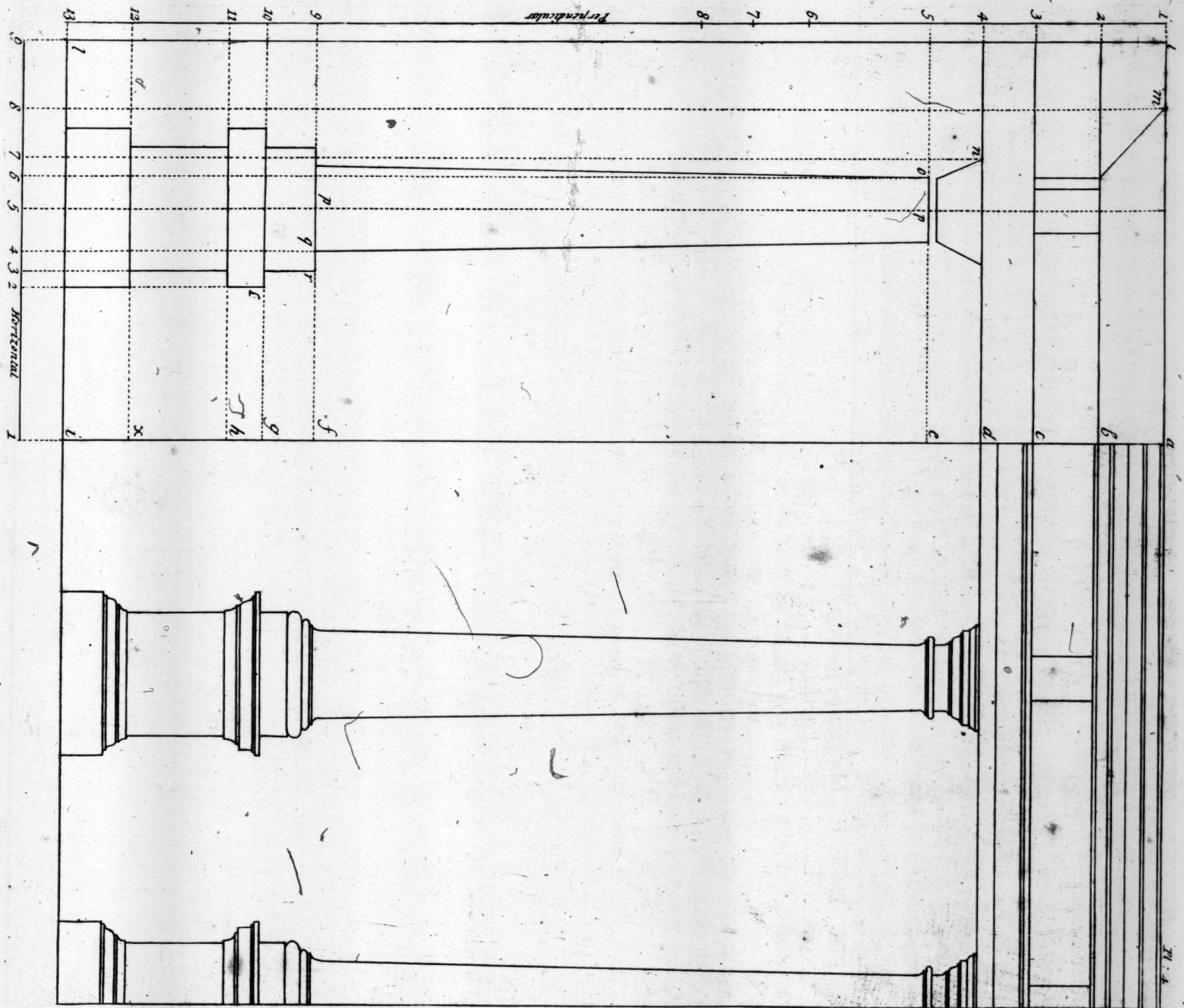


Plate 3.







OPERATION II.

To form Colonnades with Pedestals.

TO form Colonnades with Pedestals, fasten the fix'd Leg (as directed in the foregoing Operation) to the beginning of the first Line mark'd with T, of the first Interstice upon the first Face of the Limb, open the other to the end of the said Division, represented by the perpendicular Line 1, 13, take the Quantity of the Line AI, with a Pair of Compasses, see where it transversally fits upon the said Lines of Proportion; we will suppose to 7, 7, and 4, 4; when that is examin'd, slide the moveable Leg to 12, 11, 10, 9, 5, 4, 3, 2, omitting, as before, 8, 7 and 6, the Heights of the Imposts of Arches, and to every Point take the same transversal Space 7, 7, and 4, 4, with which fix one Point of your Compasses at A, to mark the following Intersections X, H, G, F, E, D, C, B, with parallel Lines, that give you all the Heights requisite.

For the Widths, fasten the fix'd Leg to the beginning of the second Space, in the second Interstice upon the second Face of the Limb, for the Widths of Colonnades with Pedestals, open the other to the end of the said Space, and of the lesser Intercolumnation, represented by the horizontal Line 1, 2, 3, 4, 5, 6, 7, 8, 9; and to every Point, take the said transversal Space 7, 7, and 4, 4, with which fix one Point of your Compasses at A, D, E, F, G, to mark the following Intersections AL, AM, DN, EO, EP, FQ, FR, GS, IL, with proper Lines, that give all the Widths requisite to form Colonnades with Pedestals.

C

OPERATION

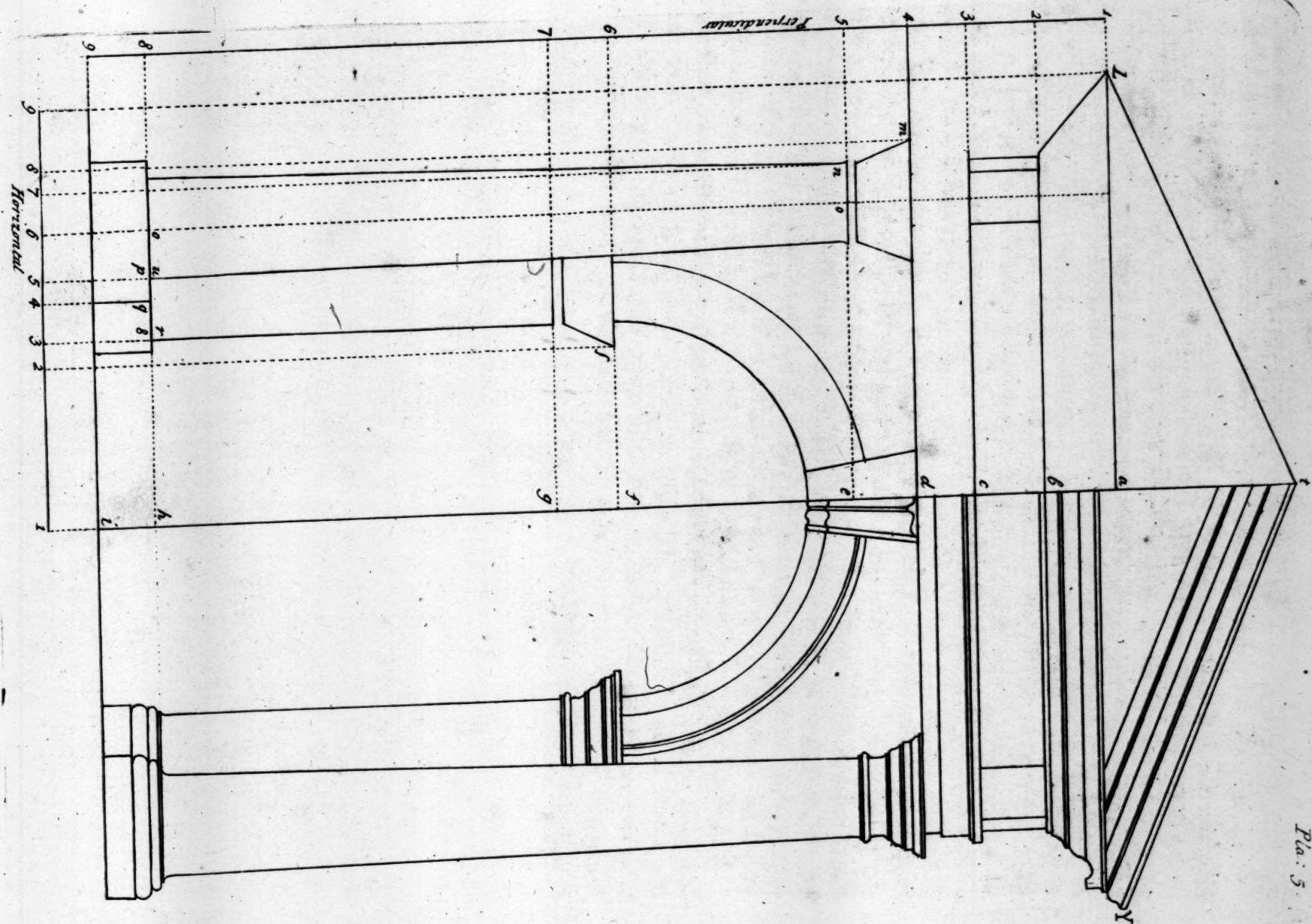
OPERATION III.

To form Arches without Pedestals.

THE same method is to be observ'd, to form Arches without Pedestals, as was in Colonades without Pedestals: Therefore fasten the fix'd Leg to the beginning of the first Interstice upon the first Face of the Limb for the heights of Colonades and Arches, represented by the perpendicular Line 1, 9; open the other to 9, take the quantity of the Line A I, see where it transversally fits upon the Lines of Proportion, suppose to 7, 7, and 4, 4; then slide the moveable Leg to 8, 7, 6, 5, 4, 3, 2, and to every point take the transversal space 7, 7, and 4, 4, with which fix one Point of your Compasses at A, to mark the following Lines H, G, F, E, D, C, B, for all the Heights requir'd; observing that G and F are to be understood as the lesser Imposts of these Arches.

For the Widths, fasten the fix'd Leg to the beginning of the third Space in the first Interstice, upon the second Face of the Limb, for the Widths of Arches without Pedestals, represented by the horizontal Line 1, 9; open the other to the end of the said Space; then slide the moveable Leg to 8, 7, 6, 5, 4, 3, 2, and to every Point take the said transversal Space 7, 7, and 4, 4, with which fix one Point of your Compasses at A, D, E, F, G, H, I, to mark the following Intersections L, M, N, O, P, Q, R, S with proper Lines: And with the distance H S, and H V, fix one Point of your Compasses at F, to form the Arch.

You must observe, that half the Width of the Architrave round the Arch gives half that of the Key Stone, in the narrowest part; in the other we will shew how the Scrole is to be form'd. If a Frontispiece is requir'd to place over the Arch, take the distance L V, fit it transversally upon the Lines of Proportion to 9, 9; when the Instrument is thus set, take the transversal Space 2, 2, which gives the Height of the Frontispiece.

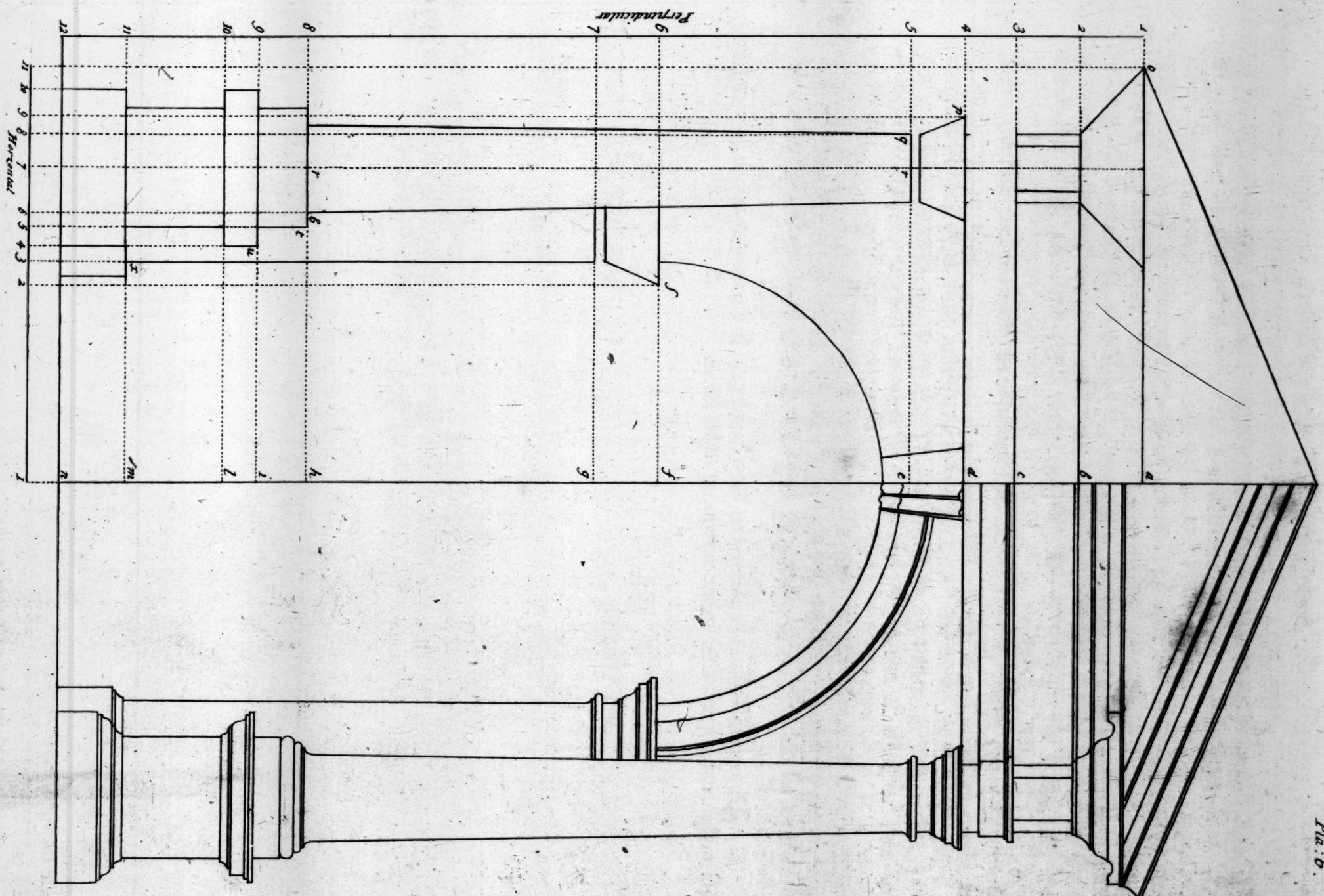


Plat. 5.





Pl. 6.



OPERATION IV.

To form Arches with Pedestals.

THE same correspondence that Arches without Pedestals have with Colonnades without Pedestals (as to their Heights) Arches with Pedestals also have with Colonnades with Pedestals: Therefore fasten the fix'd Leg to the beginning of the first Interstice, upon the first Face of the Limb, represented by the perpendicular Line 1, 12; open the other to the end of the Division; take the quantity of the Line A N, see where it transversally fits upon the Lines of Proportion, suppose to 7, 7, and 4, 4; then slide the moveable Leg to 11, 10, 9, 8, 4, 6, 5, 4, 5, 2, and to every Point take the said transversal Space 7, 7, and 4, 4, with which fix one Point of your Compasses at A, to mark the following Intersections M, L, I, H, G, F, E, D, C, B, with proper Lines, that give all the Heights; observing that G and F are for the greater Imposts.

For the Widths, fasten the fix'd Leg to the beginning of the fourth and last Space in the first Interstice, upon the second Face, represented by the horizontal Line 1, 11; open the other to the end of the said space; then slide the moveable Leg to 10, 9, 8, 7, 6, 5, 4, 3, 2; and to every Point take the same transversal Space 7, 7, and 4, 4, with which fix one Point of your Compasses at A, D, E, F, H, I, L, M, to mark the correspondent Intersections O, P, Q, R, R, B, T, V, X, with proper Lines, that give all the Widths necessary, to form the *Tuscan* Arch with Columns with Pedestals.

The Architrave round the Arch, the Key Stone and Frontispiece, are to be form'd after the manner directed in the foregoing Operation.

OPERATION

OPERATION V.

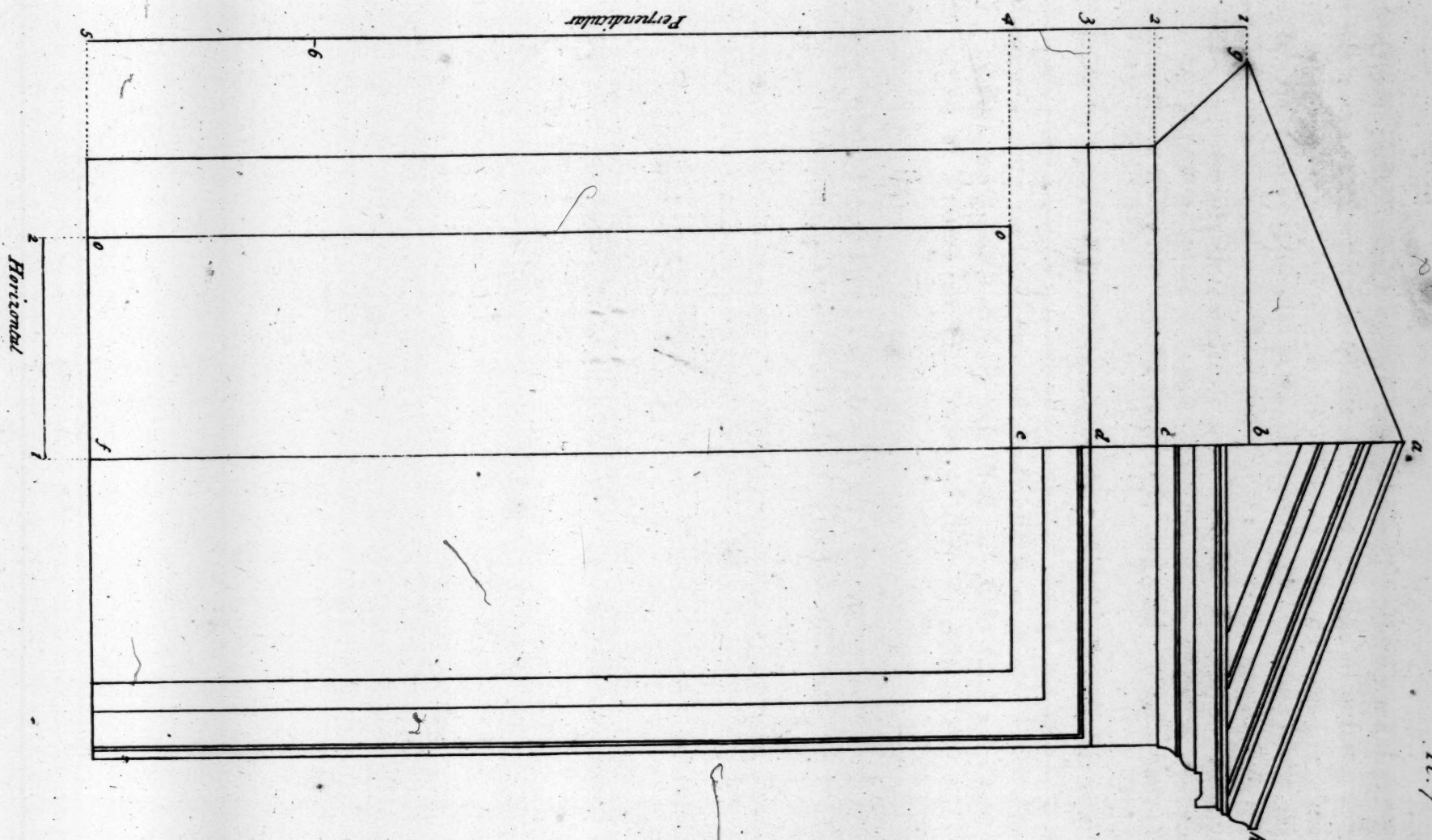
To form Tuscan Doors.

TO form principal Doors of the *Tuscan* Order, fasten the fix'd Leg to the beginning of the first Space in the second Interstice, upon the first Face of the Limb, for the Heights and Widths of Doors, represented by the perpendicular Line 1, 5, open the other to the end of the said Space; take the quantity of the Line F B, with a Pair of Compasses, and see where it transversally fits upon the Lines of Proportion, suppose to 9, 9; then slide the moveable Leg to 2, 3, 4, and to every Point, take the transversal Space 9, 9, with which fix one Point of your Compasses at F, to mark the Intersections C, D, E with proper Lines, for the Heights.

For the Widths, the fix'd Leg being still fasten'd at 5, move the other to 6 (5, 6, being the Width represented by the horizontal Line 1, 2,) and take the same transversal Space 9, 9, with which fix one Point of your Compasses at F and E, to mark the Line O O, for half the Width of the Door, and as E D is the Height of the Architrave, it will be very easy to convey it round with a Pair of Compasses.

N. B. The Projecture of the Cornice is to equal its Height, and the Frontispiece to be form'd as directed in the foregoing Operations.

OPERATION

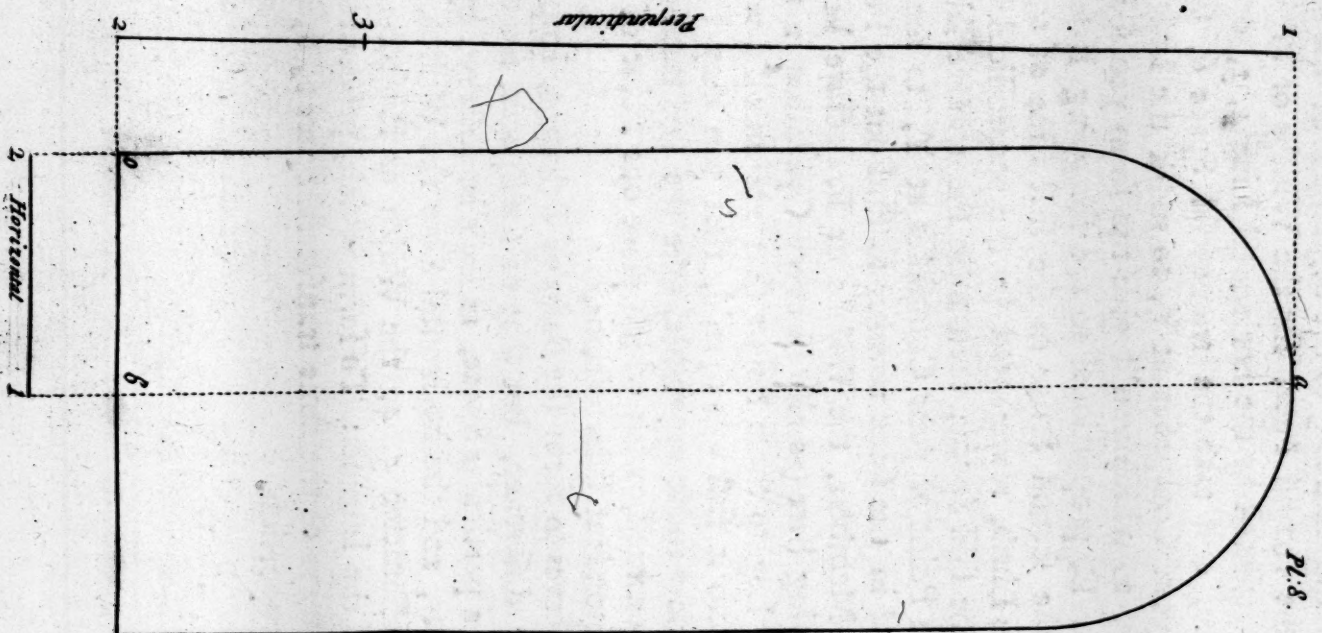




OPERATION VI.

To form Niches.

THE simplicity of Niches makes them very easy to form; therefore, fasten the fix'd Leg to the beginning of the second Space, in the second Interstice, upon the first Face of the Limb, for the Height and Width of Niches, represented by the perpendicular Line 1, 2, open the other to the end of the said Division, and take the quantity of the Line A B, see where it fits transversally upon the Lines of Proportion, suppose to 15, 15; then slide the moveable Leg to 3 (the other being still fastened at 2) being the Width represented by the horizontal Line 1, 2; take the transversal Space 15, 15, with which fix one Point of your Compasses at B, to mark the Line O, for half the void, and with it form the Arch or round of the said Nich.



D

OPERATION

OPERATION VII.

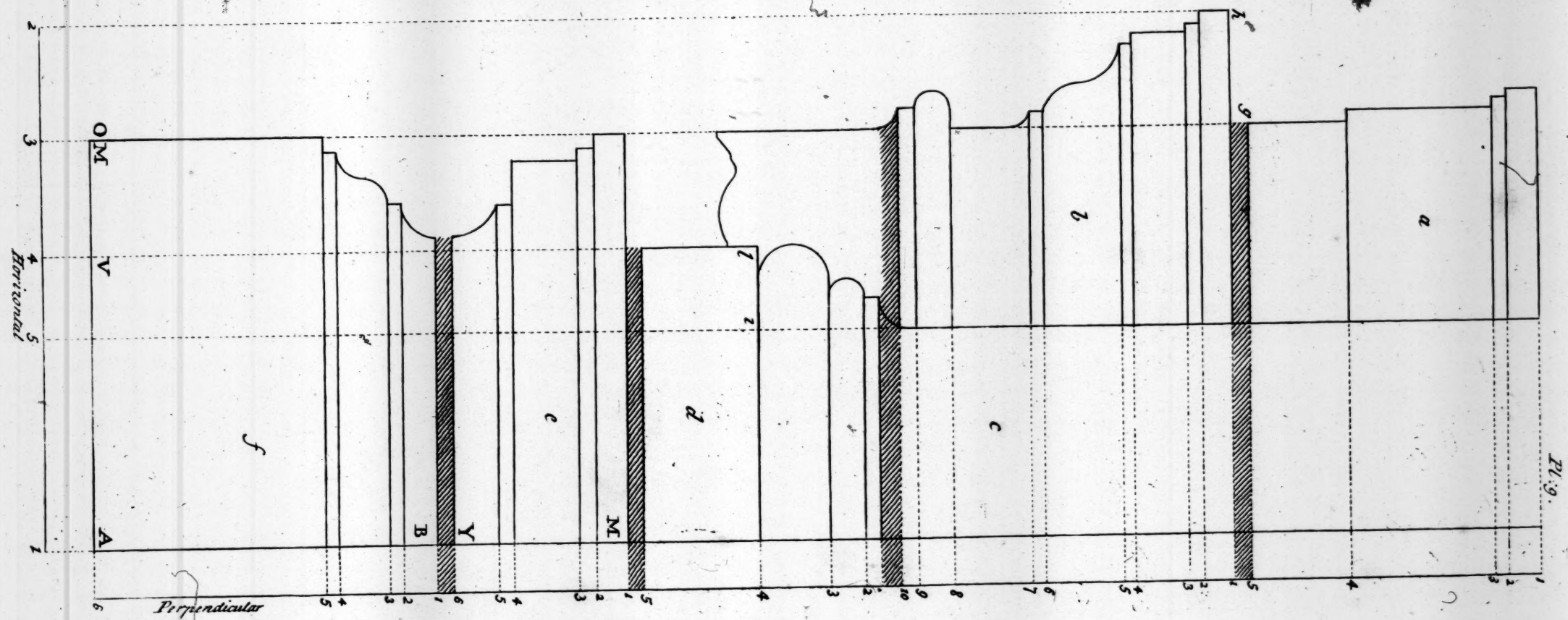
To form the Basements.

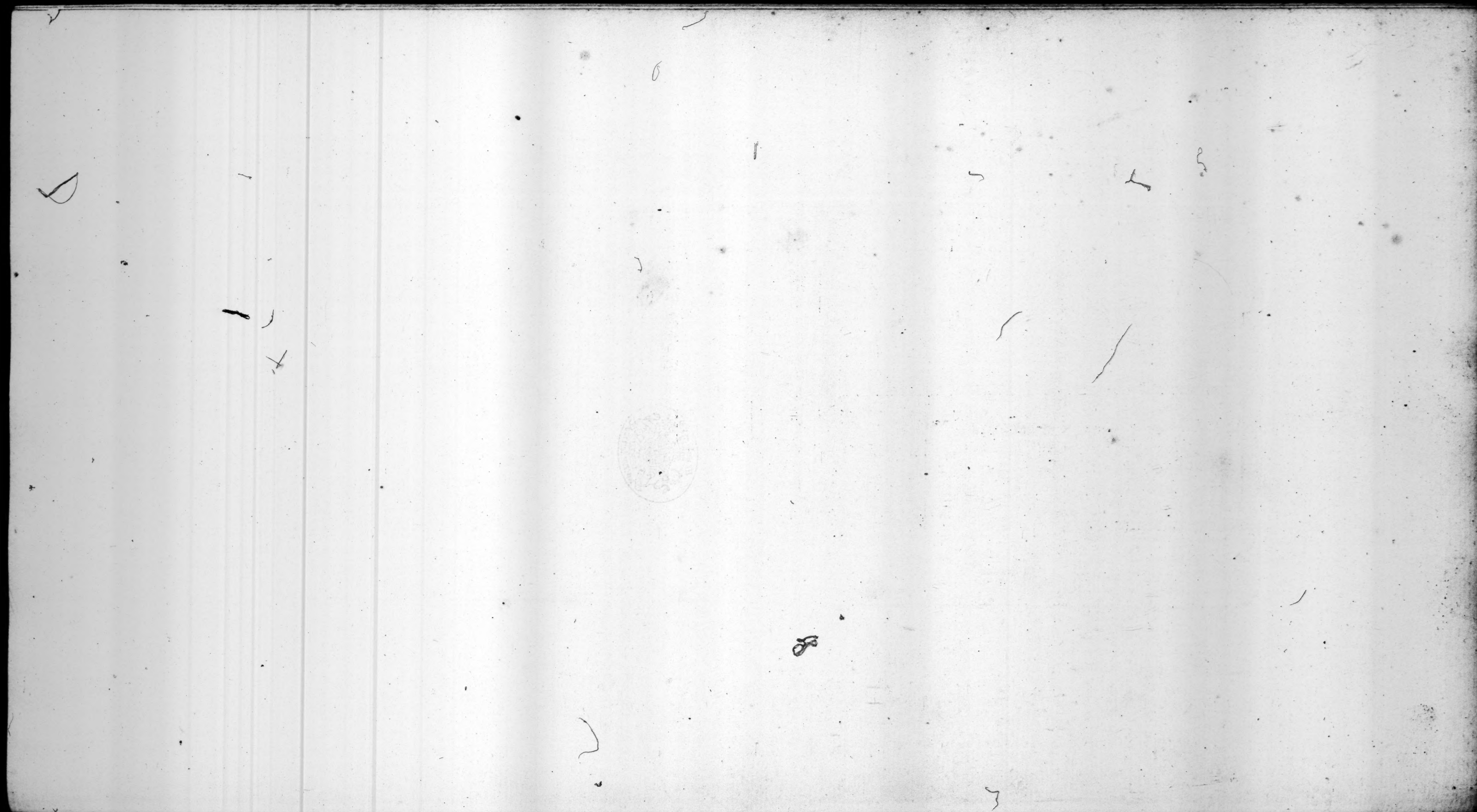
HAVING in the foregoing Operations taught how to form Colonades, Arches, Doors, and Niches, it is proper now to teach how to form their particular Members, divided into two Parts, *viz.* Basements and Entablature: Therefore, if the Base F, of the *Tuscan* Pedestal, is required, fasten the fix'd Leg to the beginning of the first Space, in the first Line of the third Interstice, upon the first Face of the Limb, represented by the perpendicular Line 1, 2, 3, 4, 5, 6, open the other to the end of the said Space; take the Height AB, with a Pair of Compasses, see where it transversally fits upon the Lines of Proportion, suppose to 6, 6, and 9, 9; then slide the moveable Leg to 2, 3, 4, 5, and to every Point take the transversal Space 6, 6, and 9, 9, with which fix one Point of your Compasses at A, to mark the correspondent Intersections upon the Line AB, with proper Lines, for all the Heights.

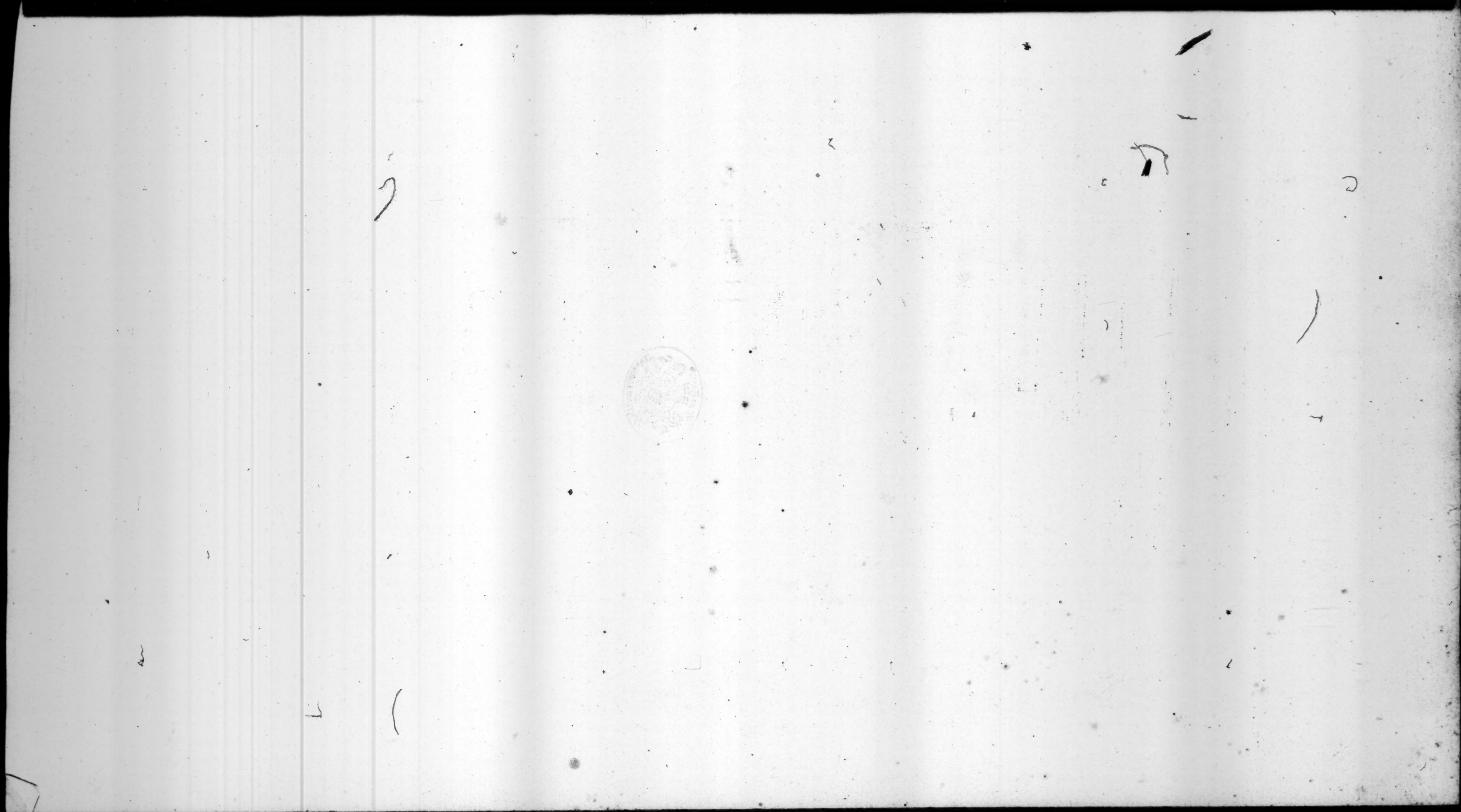
For the Widths, fasten the fix'd Leg to the beginning of the third Space, in the second Interstice, upon the second Face, for the Widths or Projecture of the Cimaesiums of Pedestals, represented by the horizontal Line 4, 3, open the other to 3, the end of the said Space, and take the transversal Space 6, 6, and 9, 9, with which fix one Point of your Compasses at V, to mark the Intersection MO, for the Projecture of the Base, to which you'll give the form you see.

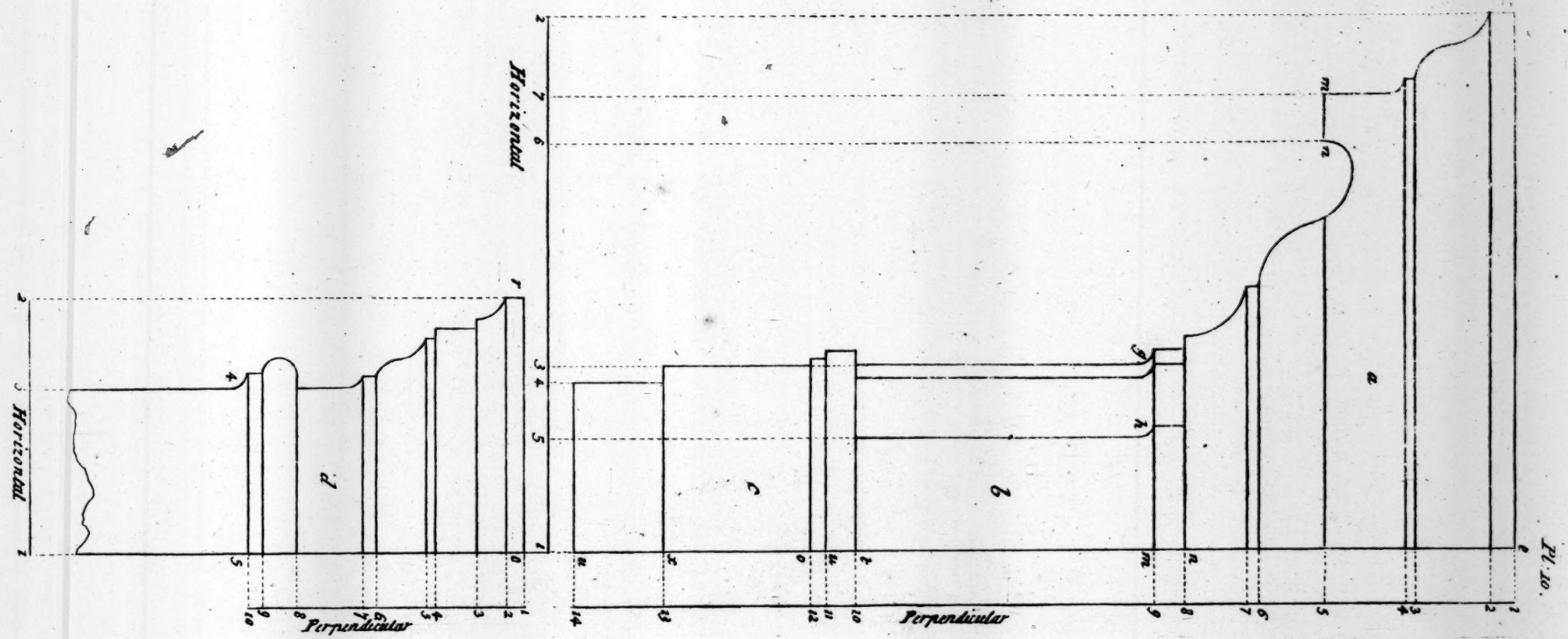
To form the Cimaesium E, proportional to the foregoing Base, fasten the fix'd Leg to the beginning of the second Space in the first Line of the third Interstice, upon the first Face of the Limb, represented by the perpendicular Line 1, 6, open the other to the end of the said Space; then take the transversal Space 6, 6, and 9, 9, with which fix one Point of your Compasses at Y, to mark the Height of the Cimaesium M; proceed in the same manner to find out the Points that give the Heights of all the other Members, the Widths or Projecture being the same as that of the Base: Observing here (as also in every Operation in the other Orders) not to slide the moveable Leg to those Points that are mark'd without the Lines, but fasten it to that whereto it first was open'd, that you may the more conveniently with the fix'd Leg (now made moveable) take the said transversal Space 6, 6, and 9, 9, to every Point omitted, with which place one Point of your Compasses at M, to mark the correspondent Intersections.

The same method also serves to form the Bases of Columns, Imposts, and Archivolts, there being no other difference, but that of the Spaces, for their Heights and Widths, each part having a particular Space, as may be observed by the black separations shewing the Heights, and the horizontal Line the Widths, and represented by 1, 5, the greater Semidiameter 5, 4, the Width or Projecture of the Bases of Columns, and 3, 2, that of the Imposts: To form which, proceed as directed in the Cimaesium, making use always of the same transversal Space 6, 6, and 9, 9, that all the parts may be in just proportion.









OPERATION VIII.

To form the Embellature.

TO form the *Tuscan* Capital proportional to the foregoing Bascments, fasten the fix'd Leg to 10, the beginning of the first Space in the first Line of the fourth and last Interstice, upon the first Face of the Limb, represented by the perpendicular Line 1, 10, open the other to 1, the end of the said Division, then take the transversal Space 6, 6, and 9, 9, with which fix one Point of your Compasses at 5, to mark the Intersection O, for the Height of the Capital; proceed in the same manner, and take the transversal Space 6, 6, and 9, 9, to every Point, for the Height of every particular Member.

For the Width or Projecture, fasten the fix'd Leg to the beginning of the fifth Space in the first Line of the second Interstice, upon the second Face of the Limb, for the lesser Semidiameters and Projecture of Capitals, open the other to the end of the said Division, take the transversal Space 6, 6, and 9, 9, with which fix one Point of your Compasses at O, to mark the Intersection R, for the Width or Projecture of the said Capital; then slide the moveable Leg to 3, and take the same transversal Space 6, 6, and 9, 9, for the lesser Semidiameter 5, 4, represented by the horizontal Line 1, 3.

To form the Cornice, proportional to the foregoing Bascments and Capital, fasten the fix'd Leg to 14, the beginning of the second Space in first Line of the fourth Interstice, upon the first Face of the Limb, represented by the perpendicular Line 1, 14, open the other to 1, the end of the said Division, and take the transversal Space 6, 6, and 9, 9, with which place one Point of your Compasses at V, to mark the Intersection E, for the Height of the Cornice; then convey the moveable Leg to 9 8, 9 10, 11, 12, and 13, and to every Point take the same transversal Space 6, 6, and 9, 9, to mark the following Intersections N, M, T, V, O, X, always placing one Point of your Compasses at V; now fasten the fix'd Leg to 8, of the said perpendicular, open the other to 1, and take the Quantity NE of the Cornice, see where it transversally fits upon the Lines of Proportion, suppose to 5, 5, then convey the moveable Leg to every Point, the transversal Space of which gives the remaining Members.

For the Projecture, fasten the fix'd Leg to 1, the beginning of the sixth Space in the second Interstice upon the second Face of the said Limb, open the other to 2, the end of the said Division, represented by the horizontal Line 1, 2, take the transversal Space 5, 5, with which place one Point of your Compasses at E, to mark the Intersection F, for the Projecture; then proceed to 7, 6, 3, 4, 5, and to every Point take the foresaid transversal Space for the correspondent Intersections, giving the said Members the form you see, proportional to the foregoing Bascments.

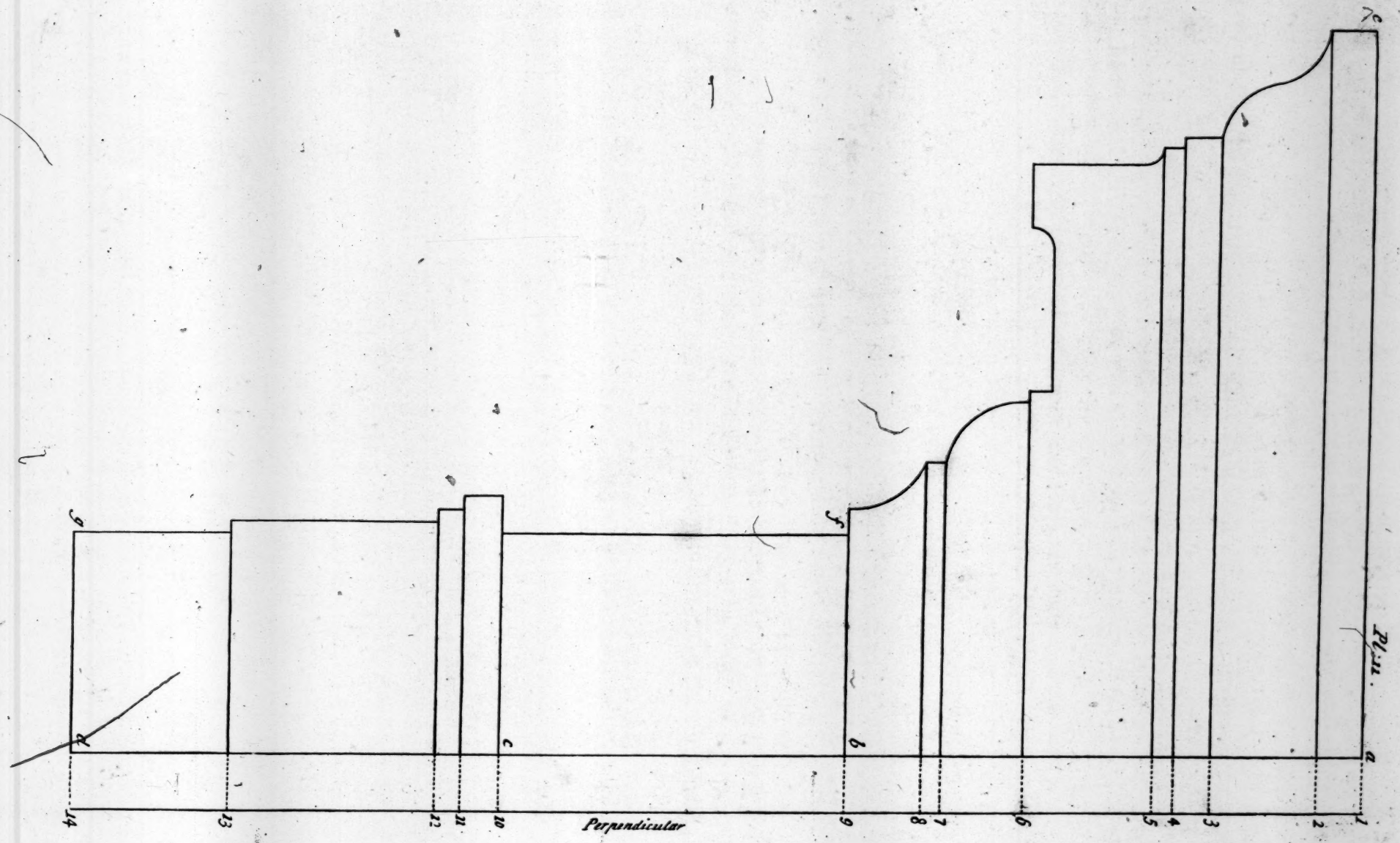
OPERATION
5

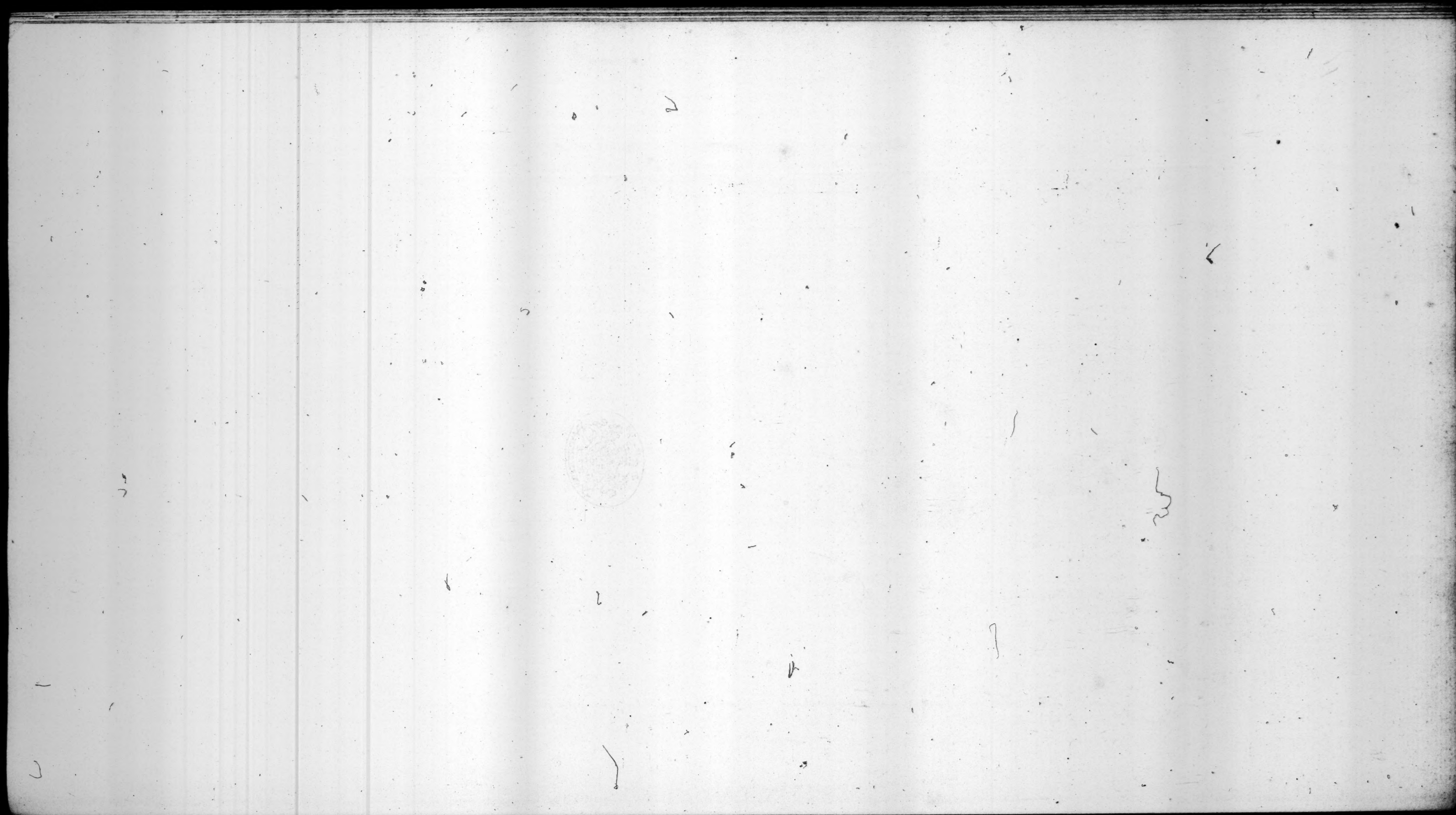
OPERATION IX.

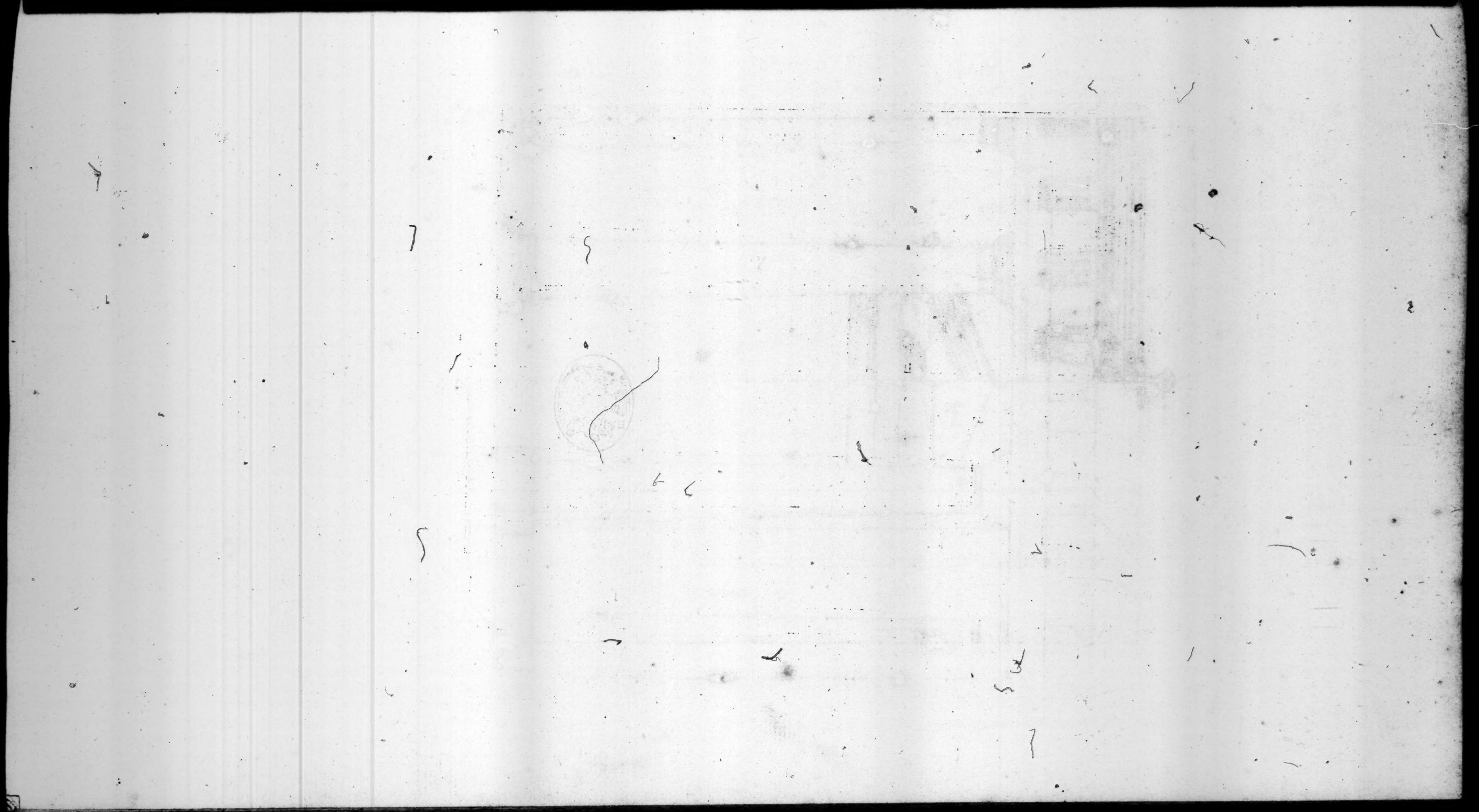
To form the Cornices of Doors.

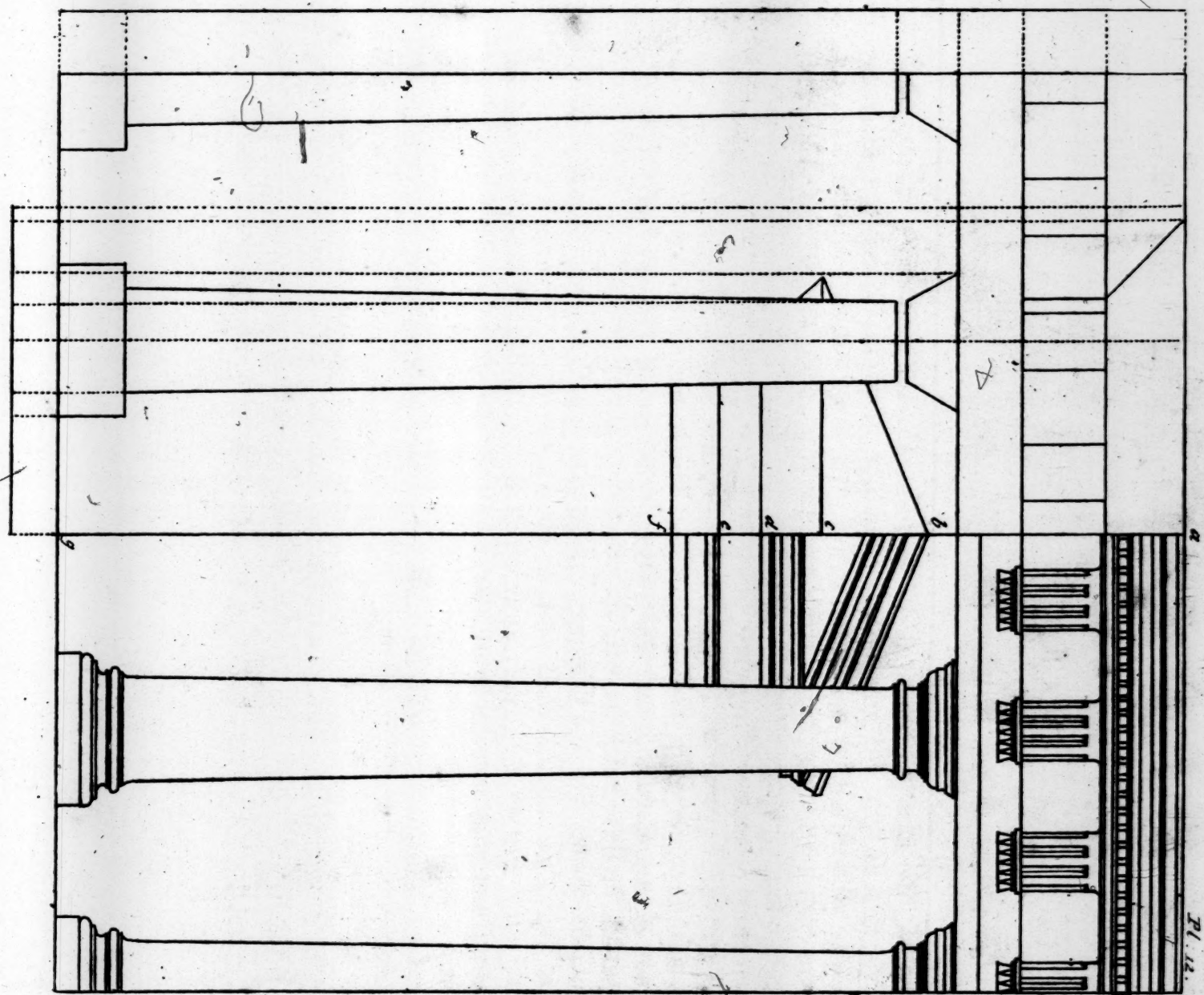
TO form the Cornices of principal Doors, fasten the fix'd Leg to 14; the beginning of the third Interstice upon the second Face of the Limb, for the Heights of the Cornices of Doors, open the other to 1, the end of the said Division, represented by the perpendicular Line 1, 14, take the Distance AD, with a Pair of Compasses, and see where it transversally fits upon the Lines of Proportion, suppose to 9, 9, and 2, 2; then slide the moveable Leg to 9, 10, 11, 12, 13, and to every Point take the said transversal Space 9, 9, and 2, 2, with which fix one Point of your Compasses at D, to mark the Intersections B, C, O, N, M; now fasten the fix'd Leg to 9, the other to 1, of the said perpendicular, take the Quantity B A, see where it transversally fits upon the Lines of Proportion, suppose to 6, 6, and 11, 11, with which place one Point of your Compasses at 6, to mark the remaining Members: the Width or Projecture being to equal the Height, may easily be found out with a Pair of Compasses.

By what has been hitherto shewn, any Person may readily comprehend how to place the particular Members in the parts of the different Orders; but for farther instruction, I'll here teach how to find out all the Members belonging to the before mention'd Cornice of the Door: Set the Instrument as if you had the following Cornice B A to form, take the Height of the said Cornice, see where it transversally fits upon the Lines of Proportion, suppose to 1, 1, and 1, 1, then proceed in the Operation as you have been directed, by which you may not only find out the Members of the Cornice, but also of Bases, Capitals, and Imposts, &c. observing always, to set the Instrument to the Spaces divided for every particular Part, of which you'd have the Members.









OF THE

D O R I C K O R D E R.

O P E R A T I O N X.

To place Doors within Colonnades without Pedestals.

IF you rightly observe the method to form Colonnades, Arches, Doors, and Niches, &c. in the foregoing Order, you'll easily comprehend how to form any other, this especially, by reason of the great affinity it has with the former, differing in nothing but the Lines, as in that the first serv'd, and in this the second is to be made use of, every Order having a proper Line.

But as in this, there are Triglyphs, and Metophs in the Cornice, that are not in the *Tuscan*, it is proper to observe, that they may very easily be form'd with the Compasses only, or with the Instrument; Triglyphs being but half the Width of the foot of the Column, and the Metophs square, the Height equal to the Width, which shall be better explain'd in the Plate for the Entablature of this Order, where the points for the Flutings, and Spaces for the Triglyphs are mark'd.

And, as Doors are considerable parts in the Orders, it is proper I should in this teach how they are to be placed, and made proportional; by the Example of which, every one may comprehend how to place them in any other Order.

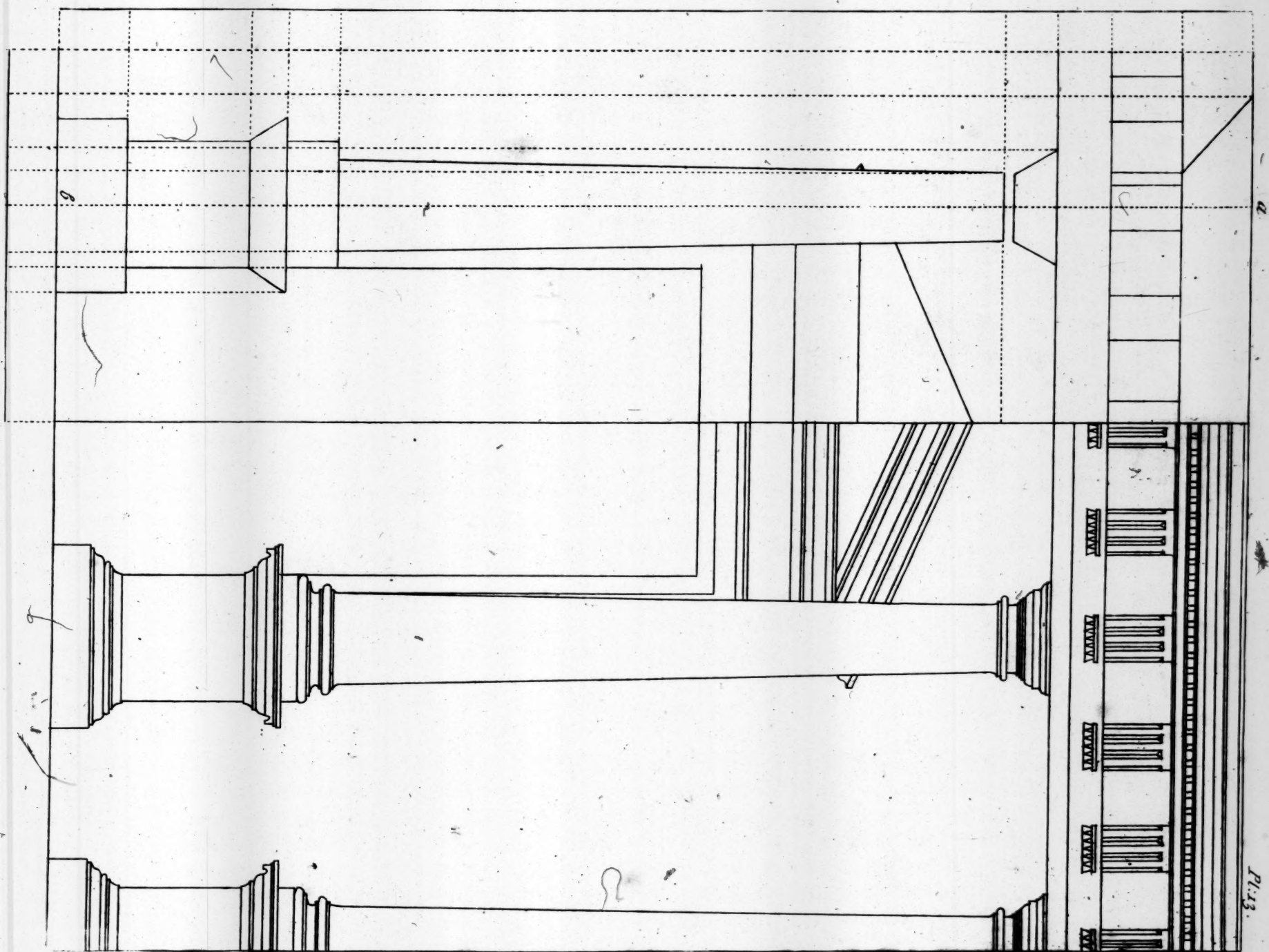
To place a principal Door within the following Colonnade, set the Instrument as if you had a Colonnade of this Order to form, with Columns with Pedestals; take the Distance A G with a Pair of Compasses, see where it transversally fits upon the Lines of Proportion, suppose to 6, 6; then set the Instrument as directed to form Doors of this Order, and to every point take the said transversal Space 6, 6, with which you'll form the Door, with all its Parts, Members, and Frontispiece proportional, and fit to place within the following Colonnade without Pedestals.

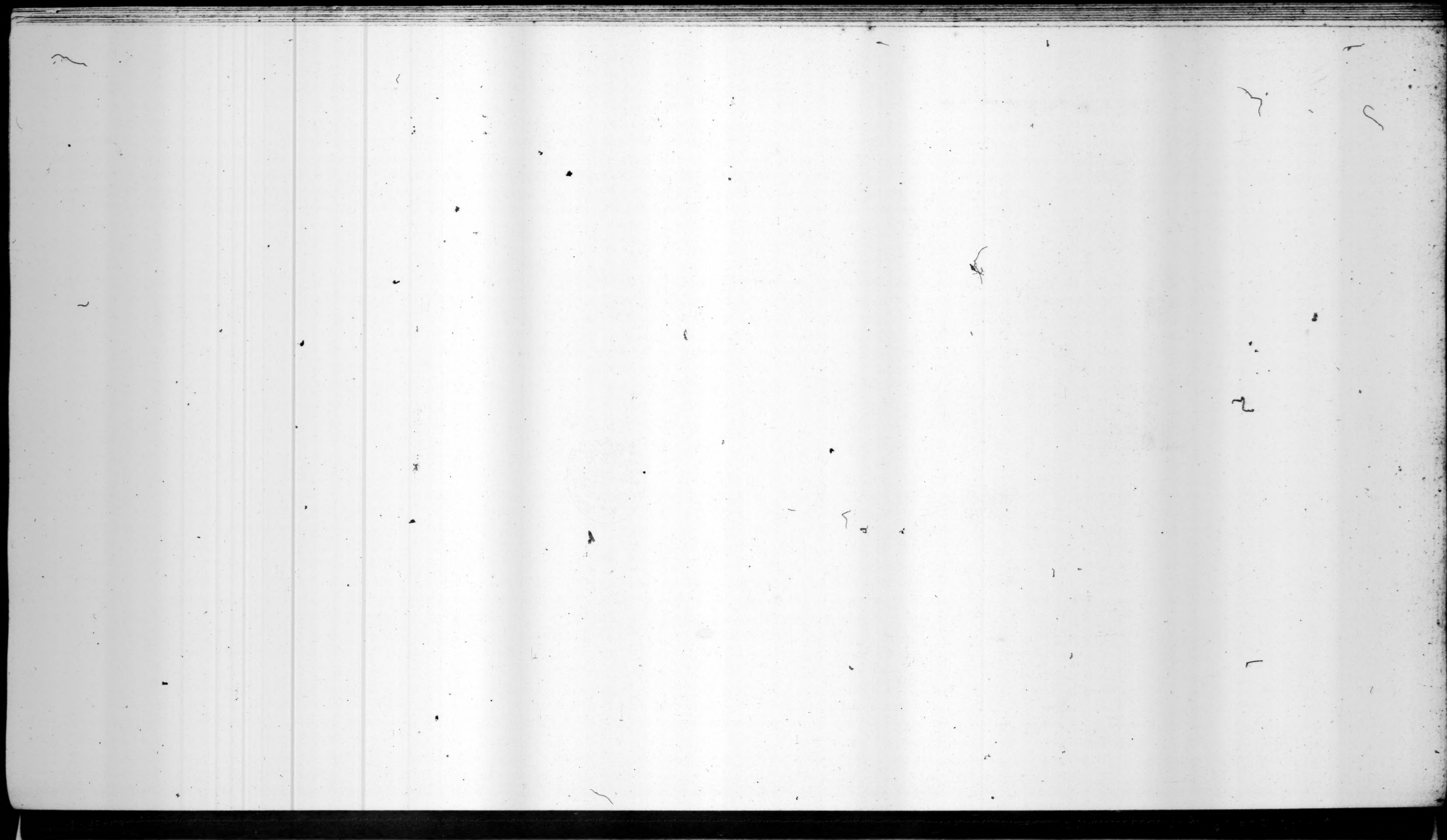
OPERATION XI.

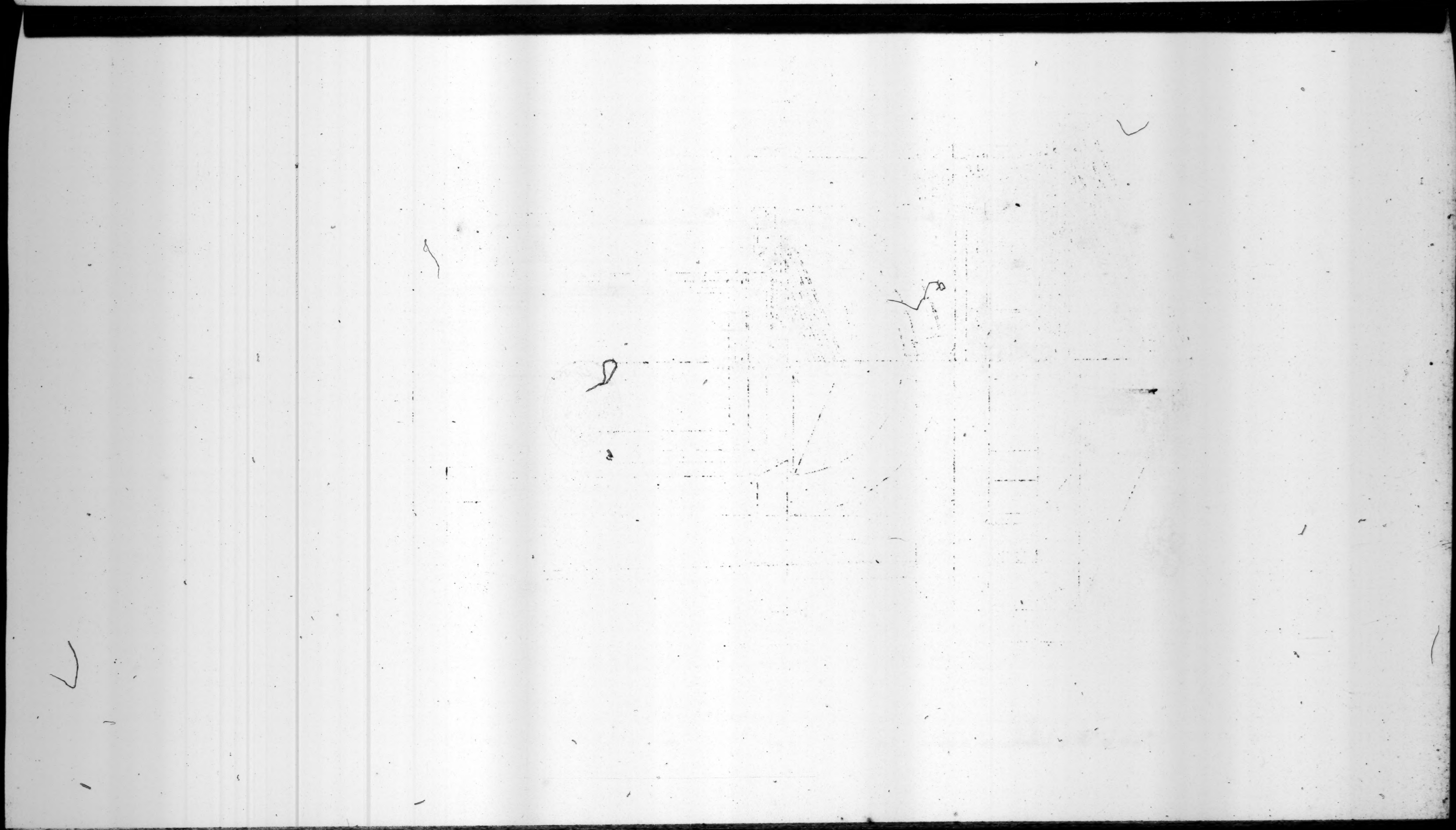
To place Doors within Colnades with Pedestals.

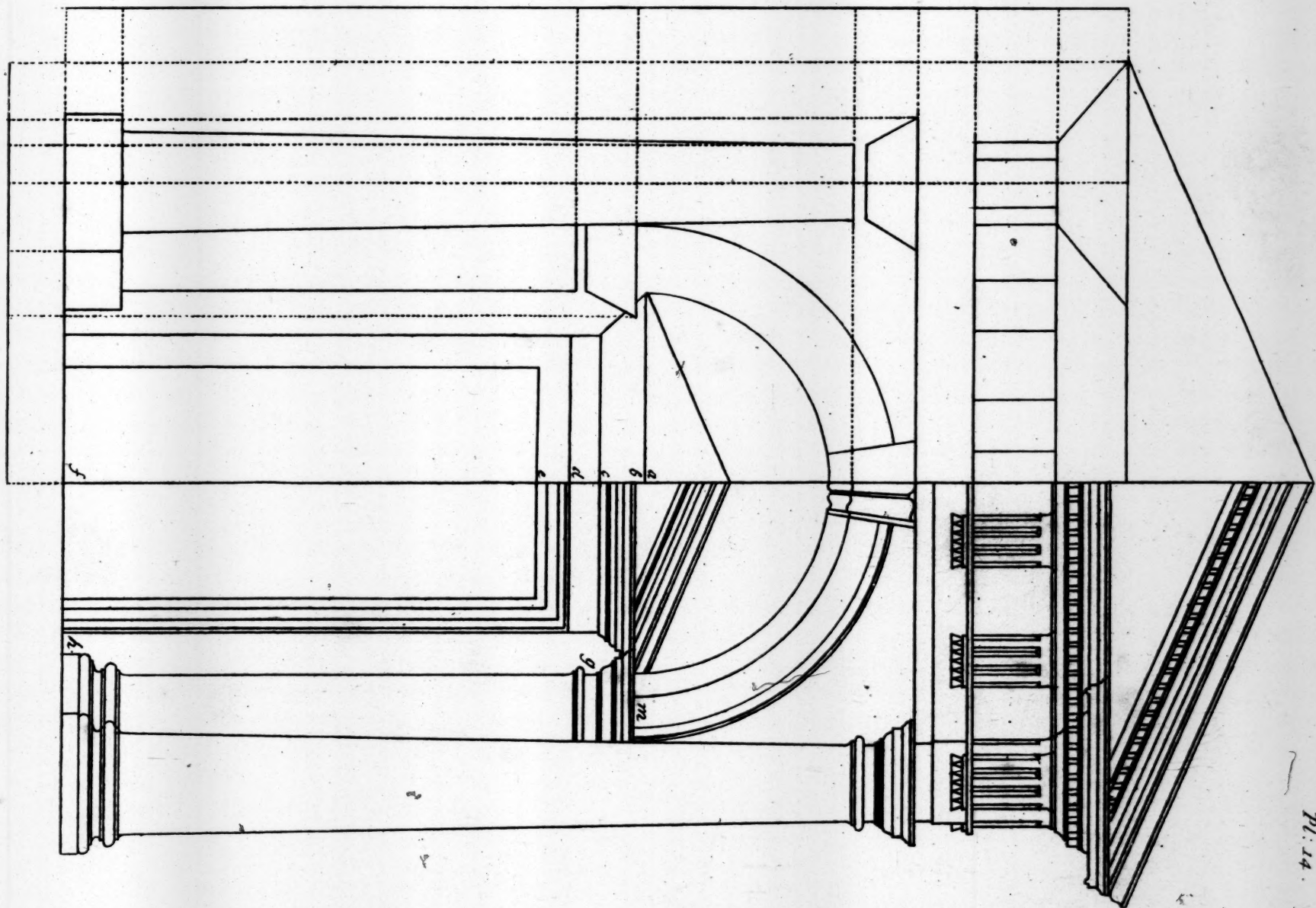
THE foregoing method serves also to place principal Doors within Colnades with Pedestals: therefore set the Instrument, as before to form *Derrick* Colnades with Pedestals, take the Height BA with a Pair of Compasses, see where it transversally fits upon the Lines of Proportion, suppose to 7, 7, and 3, 3; then set the Instrument as directed to form *Derrick* Doors, and with the said transversal Space 7, 7, and 3, 3, form the Door.

OPERATION









Pl. 14.

INSTRUMENTAL ARCHITECTURE.

OPERATION XII.

To place Doors within Arches without Pedestals.

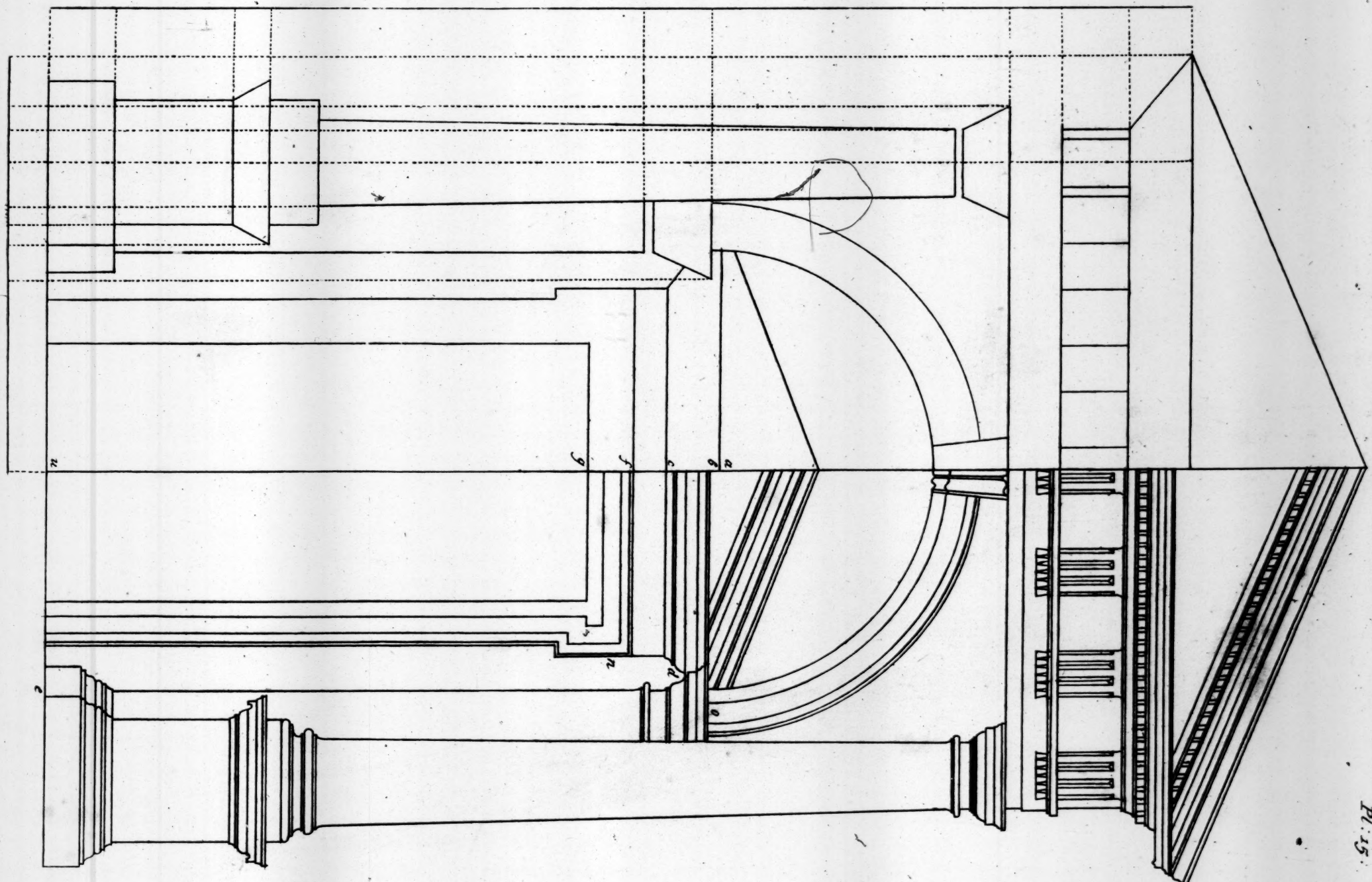
THESE are two ways to place Doors within Arches; the first is to make the upper part of the Cornice correspond directly with that of the Impost, or the Orli of the Corona in the Cornice with those that go round the said Imposts; set the Instrument, as directed to form Doors of this Order, take the Height HM with a Pair of Compasses, see where it transversally fits upon the Lines of Proportion, suppose to 4, 4, and 8, 8, with which form the Door.

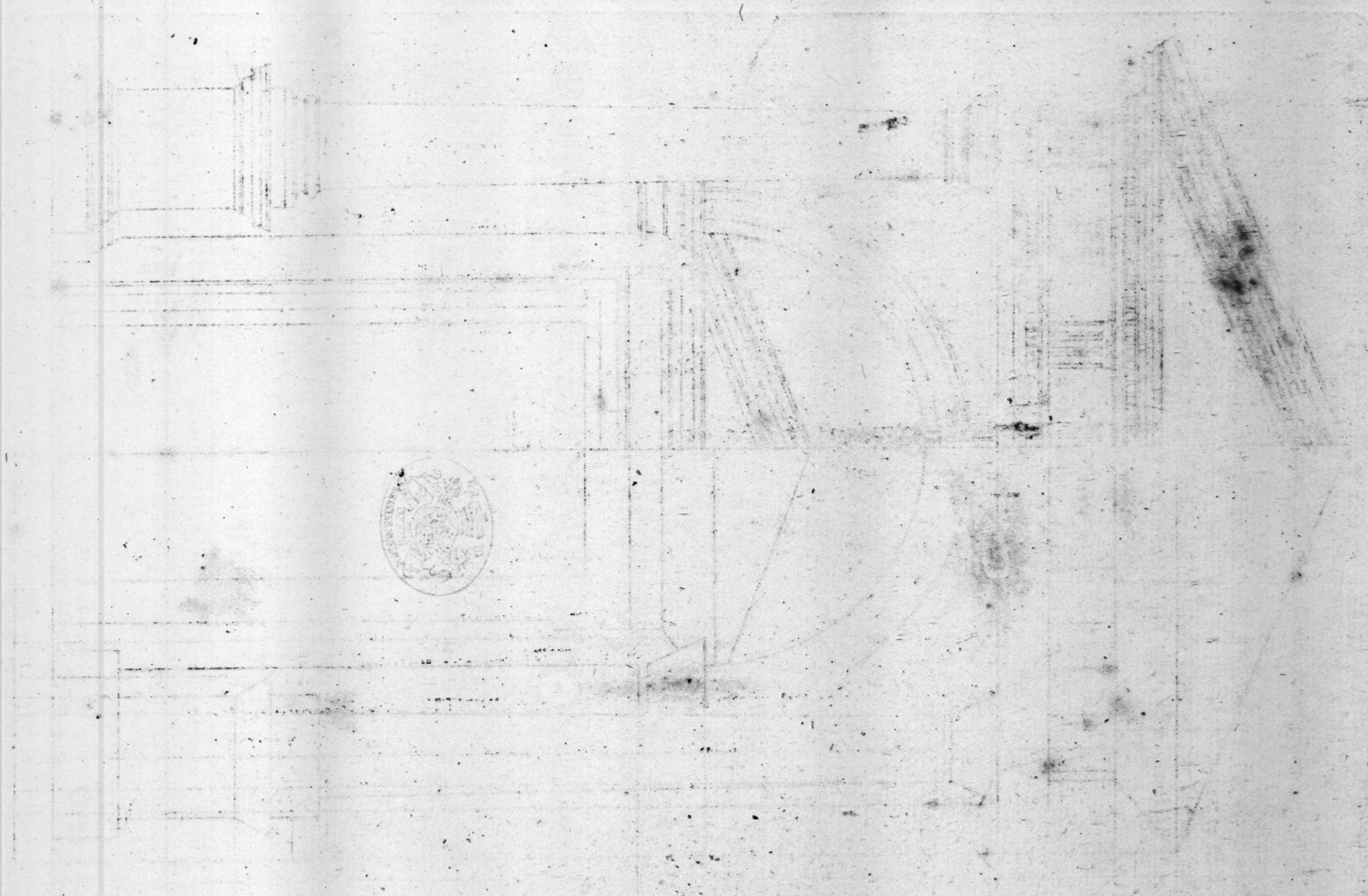
For the second, the Impost being form'd with all its proper Members, you must make the Colarino G meet directly with the upper part of the Frize; set the Instrument as directed, observing to open the moveable Leg to that point only that marks the upper part of the Frize; then take the distance HG with a Pair of Compasses, see where it transversally fits upon the said Lines of Proportion, suppose to 4, 4, and 9, 9, with which form the said Door.

OPERATION XIII.

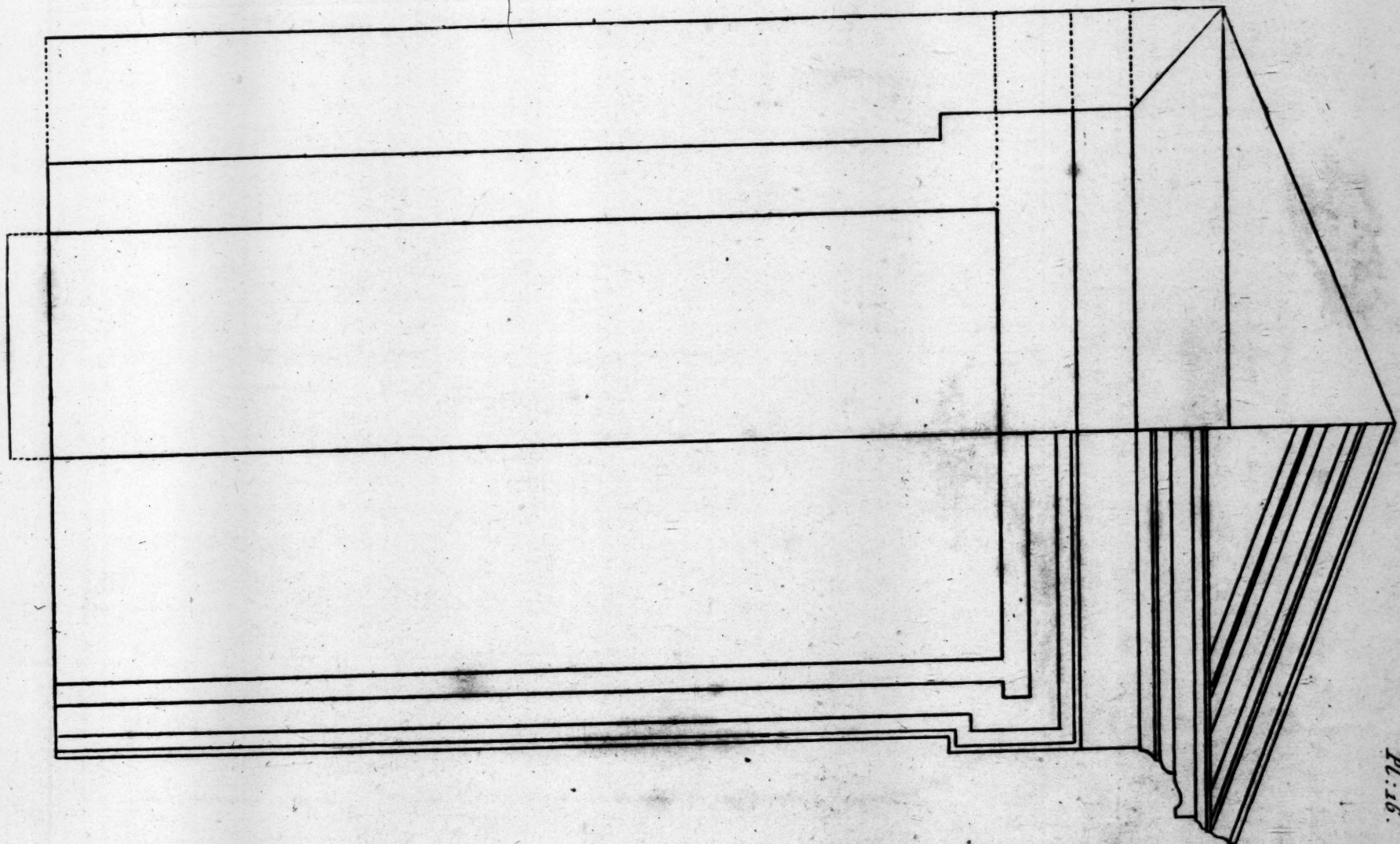
To place Doors within Arches with Pedestals.

THE method to place Doors within Arches with Pedestals, is the same as that observed in the foregoing Operation; therefore set the Instrument, as directed to form Doors, and take the Height E O, for the first Operation; for the second take the Height E D, see where they transversally fit upon the Lines of Proportion, with which Numbers form the said Door.









Pl. 16.

OPERATION XIV.

To place Doors in plain Fronts.

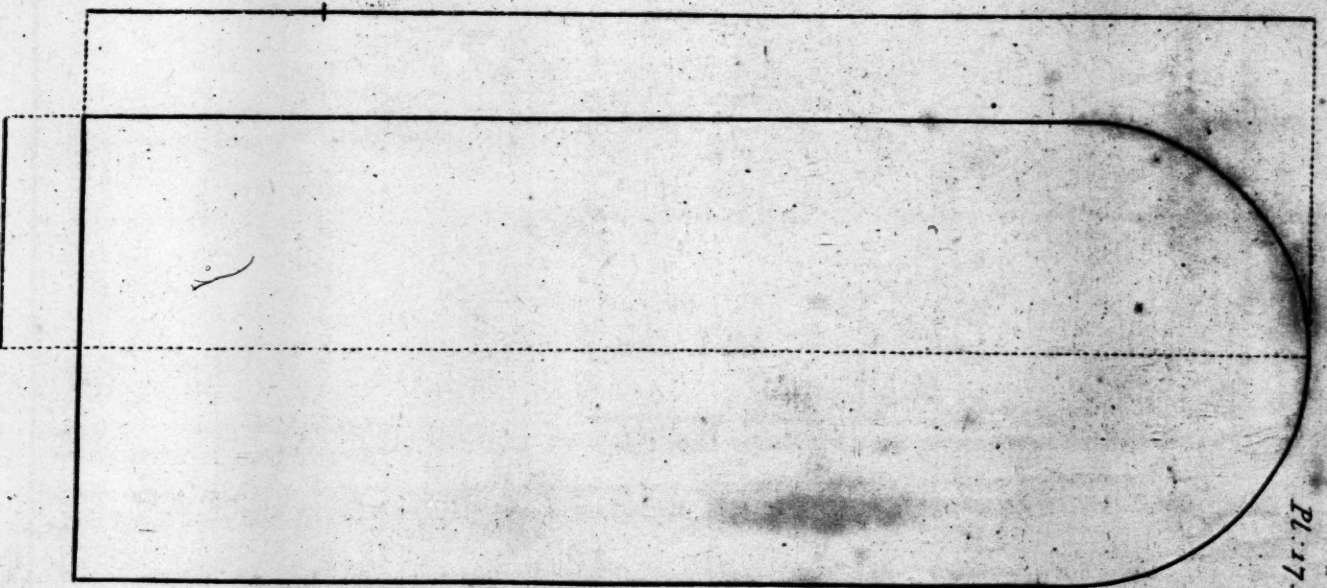
TO place Doors in a plain Front without Columns, or in that of a Temple, of one Order, set the Instrument as directed to form Colonnades with Pedestals; take the Height of the said Front, and see where it transversally fits upon the Lines of Proportion; then set the Instrument as directed to form Doors of this Order, and with the above transversal Space form the Door.

If two smaller are required to place on each side, observe to make the upper part of the opening in the greater correspond directly with the upper part of the Cornice of the smaller, which must be form'd by that Height.

OPERATION. XV.

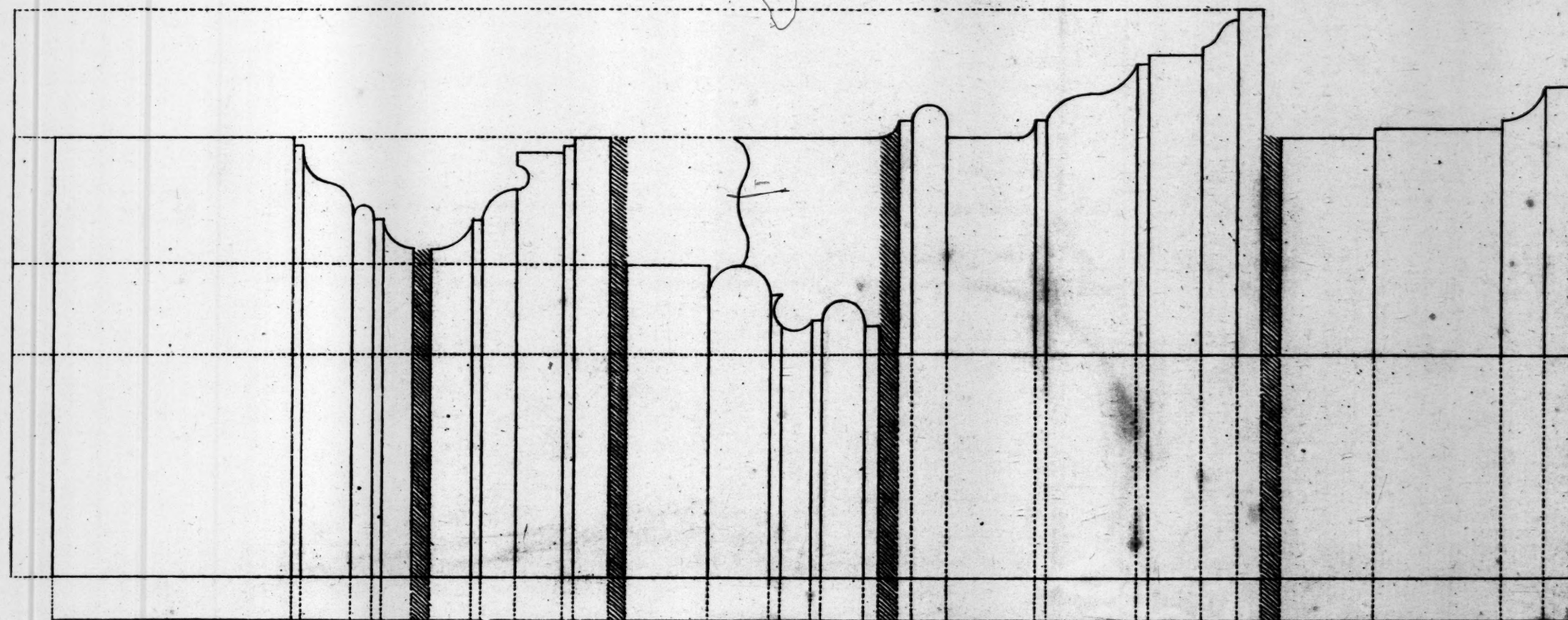
To form Doors proportional to Niches.

TO form a Door proportional to the following Niche, set the Instrument as directed to form Niches, take the Height of the said Niche, to see where it transversally fits upon the Lines of Proportion, suppose to 16, 16; then set the Instrument as directed to form Doors of this Order, and with the above transversal Space form the Door.



OPERATION





OPERATION XVI.

Of Basements.

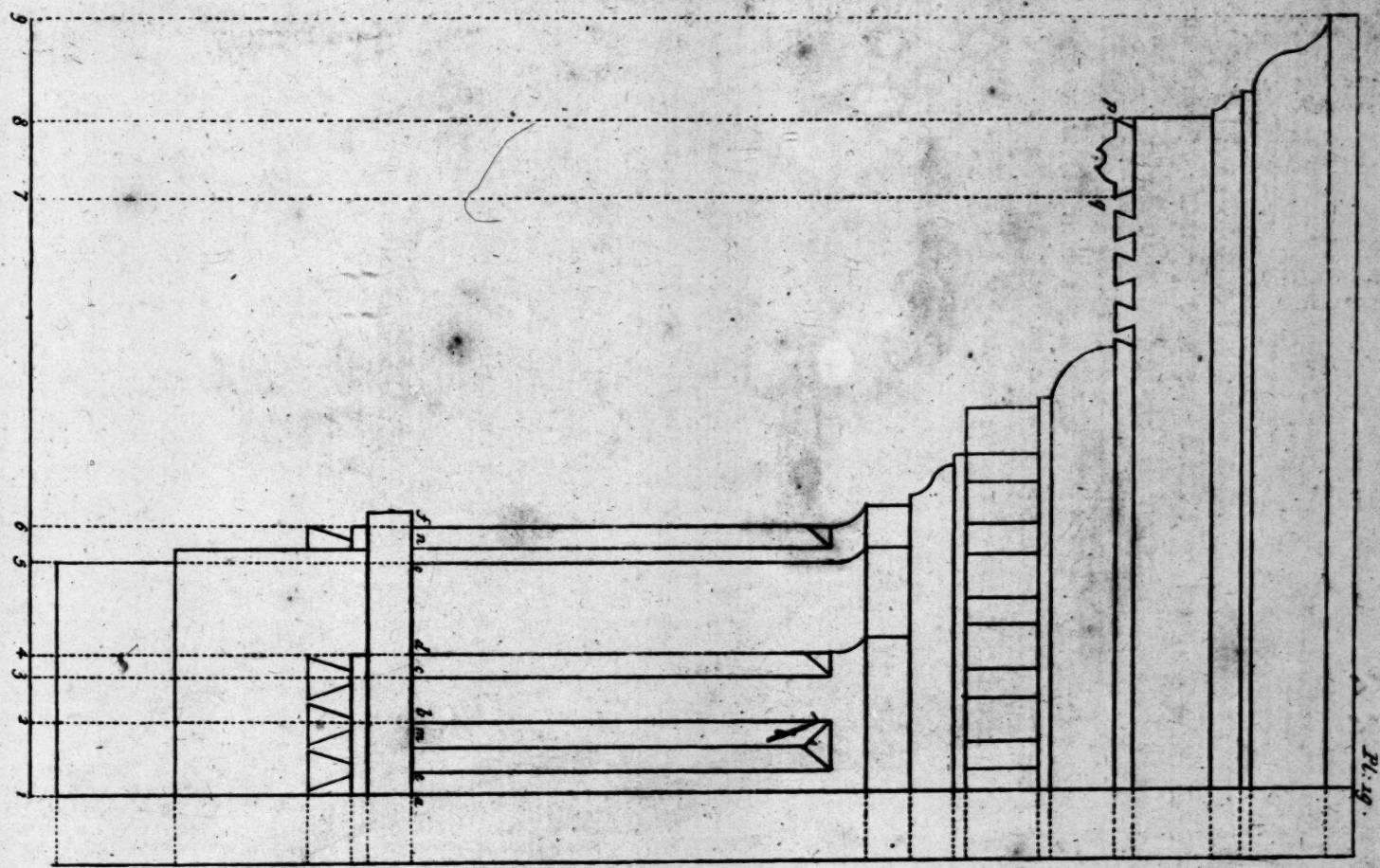
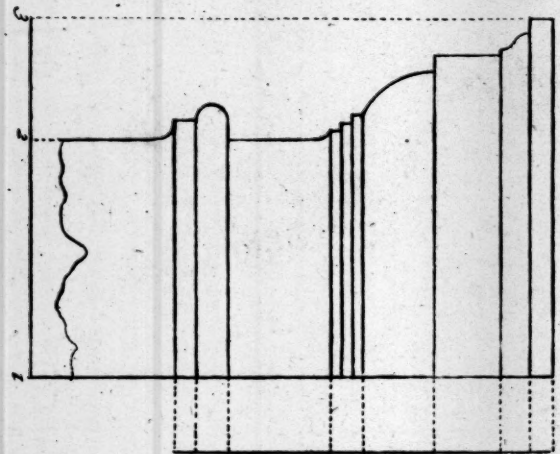
BY what has been said, and the Directions in the foregoing Operations to form Colonnades, Arches, Doors, and Niches, &c. any one may readily comprehend how to form them of any other Order, of this especially, by reason of the great affinity it has with the former.

It would therefore be needless to repeat the Directions, as by the same the Basements and Entablature of any Order may be formed, there being no other difference, but that of the Lines, each Order having a particular Line.

OPERATION XVII.

An Observation upon the Cornice in this Entablature.

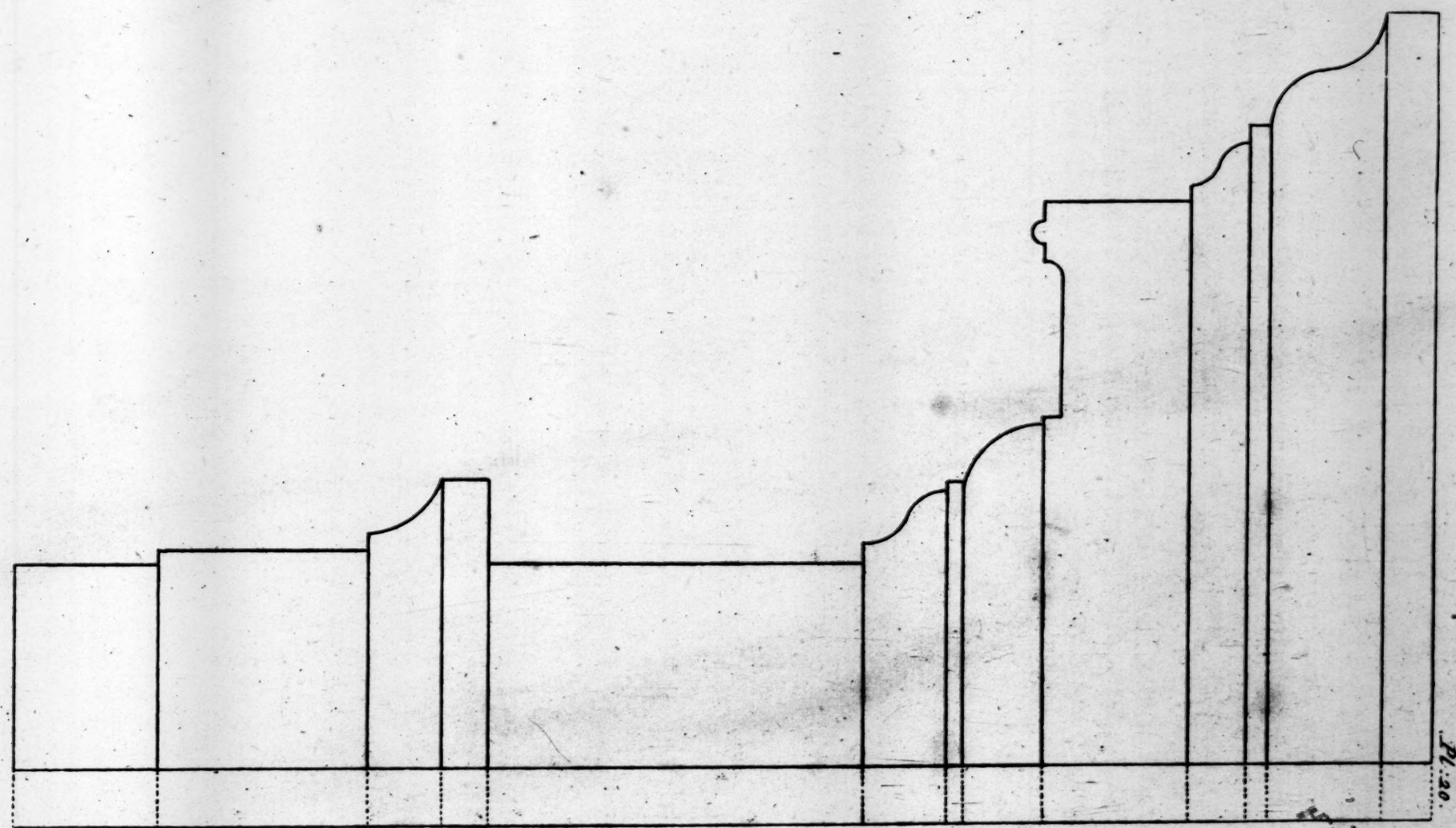
O Bserve the same method in the *Doric* Entablature as you did in the *Tuscan*, and form the Capital first, and then the Cornice; there being no other difference in the Operation, but that of fluting the Triglyphs, which may very easily be done with the following points, 6, 5, 4, 3, 2, mark'd upon the horizontal Line 1 9, transferr'd in F, O, D, C, B; then with B C, the distance between Flute and Flute, make the Flute E B, the Spaces being equal, divide it with L M, for one of the middle Flutes; with C D and N F, for the two half Flutes at the ends or extremities.



Pl. 12







OPERATION XVIII.

By any Cornice to form another greater or less, in one given Proportion.

SUPPOSE the following Cornice to be that, by which you would be willing to form another one half less; set the Instrument as if you had the said Cornice to form, take its Height, and see where it transversally fits upon the Lines of Proportion, suppose to 11, 11, the half of which is five and half, with which Numbers form the Cornice.

By this method you may form them greater or less, as you will think proper, taking the third or fourth part of 11: the same is also to be understood of Colonnades and Arches, or any other part.

OF THE
 IONICK ORDER.

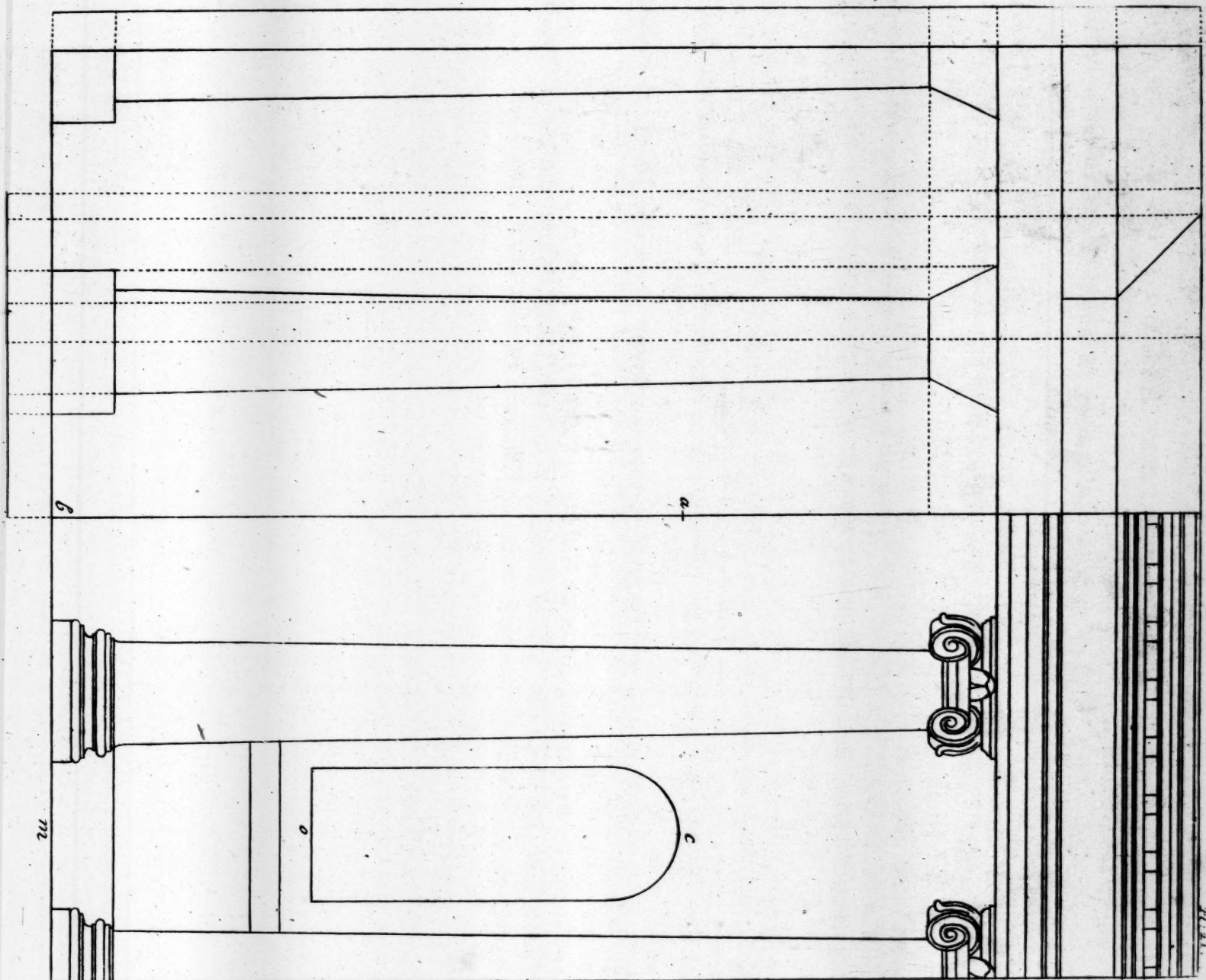
OPERATION XIX.

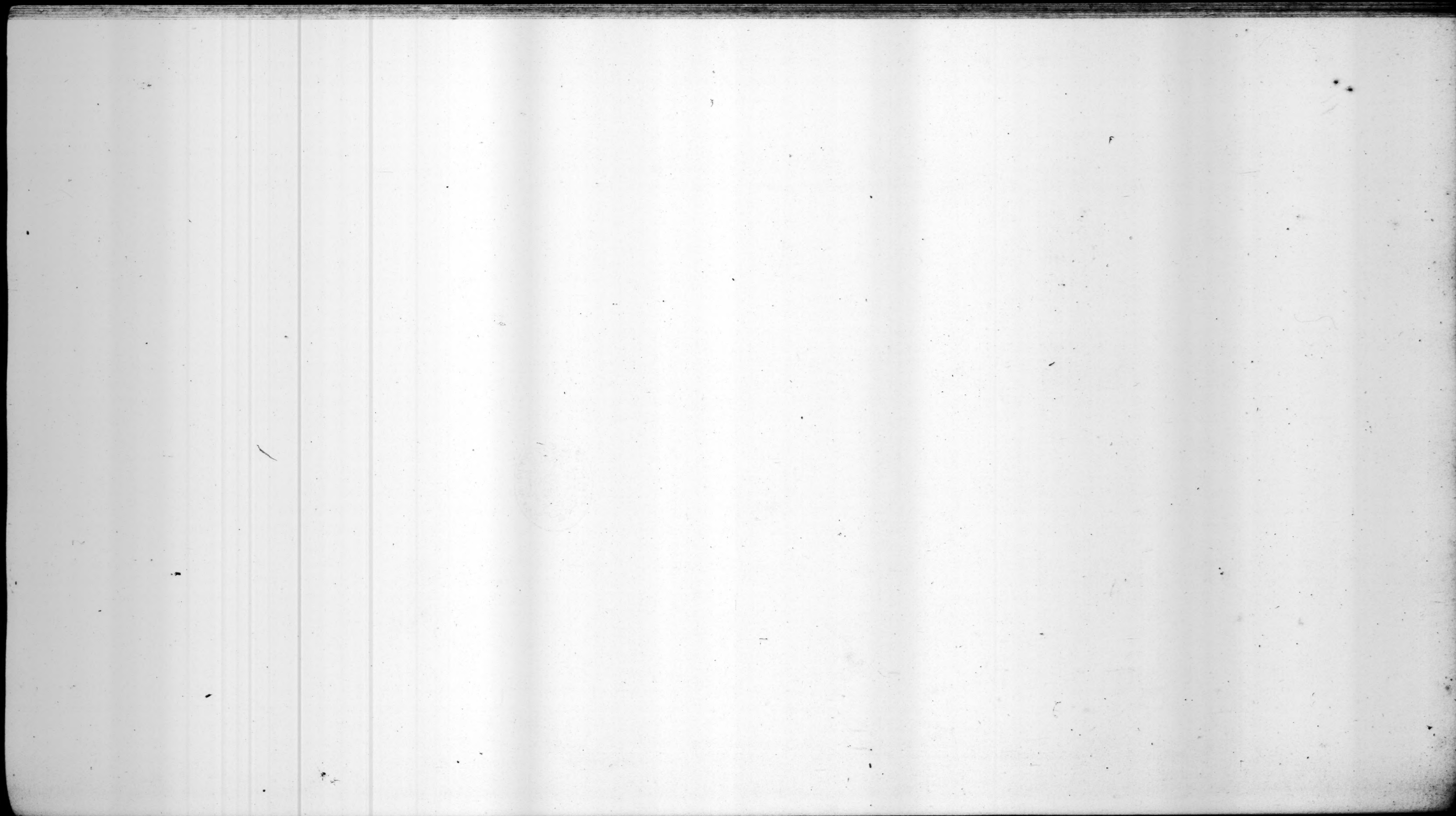
To place Niches within Colonades without Pedestals.

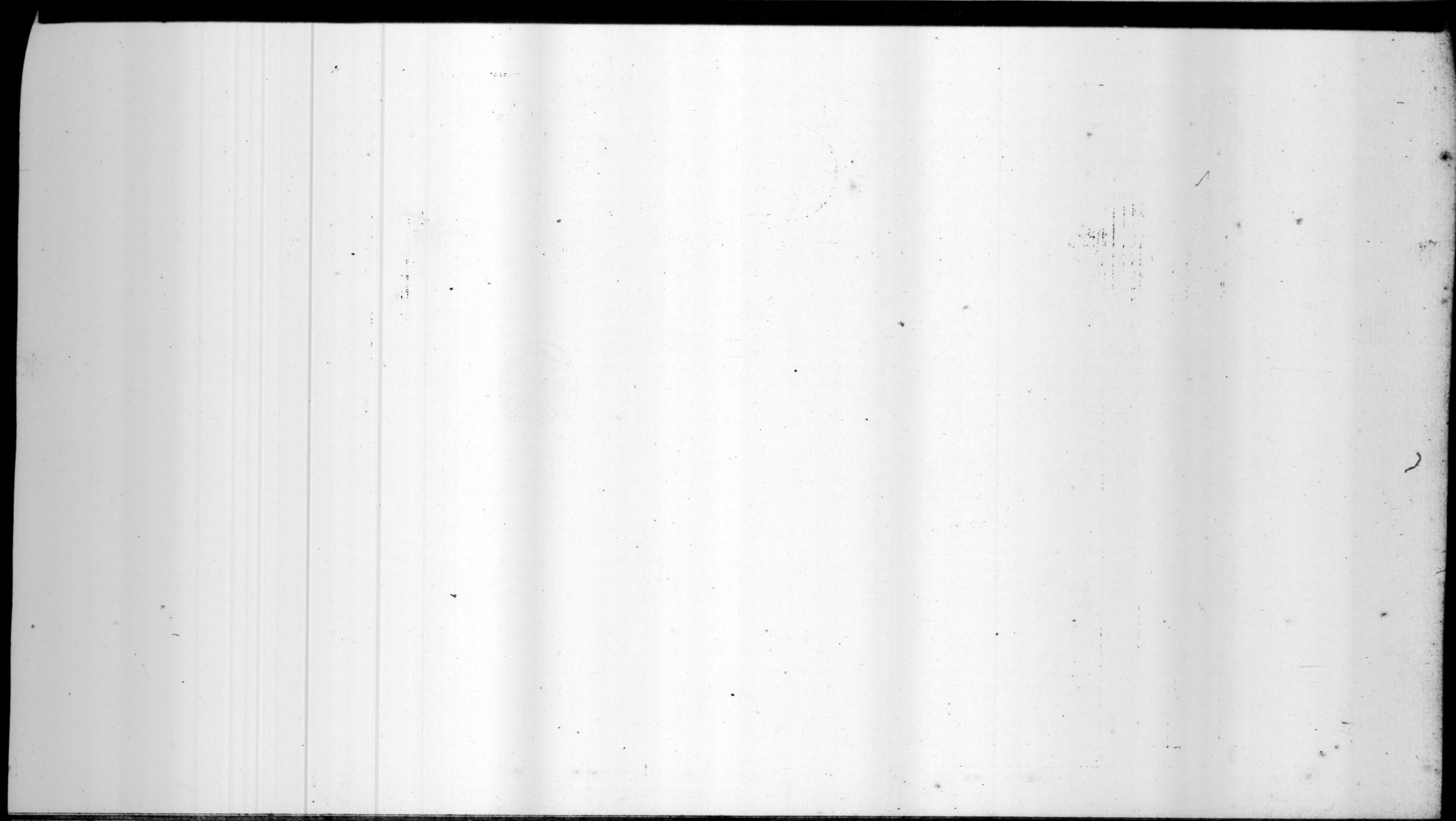
AS I have in the foregoing Order given proper Directions to place Doors within Colonades and Arches, so I'll here teach how to place Windows and Niches, as their Height must correspond directly with that of the opening of the Door.

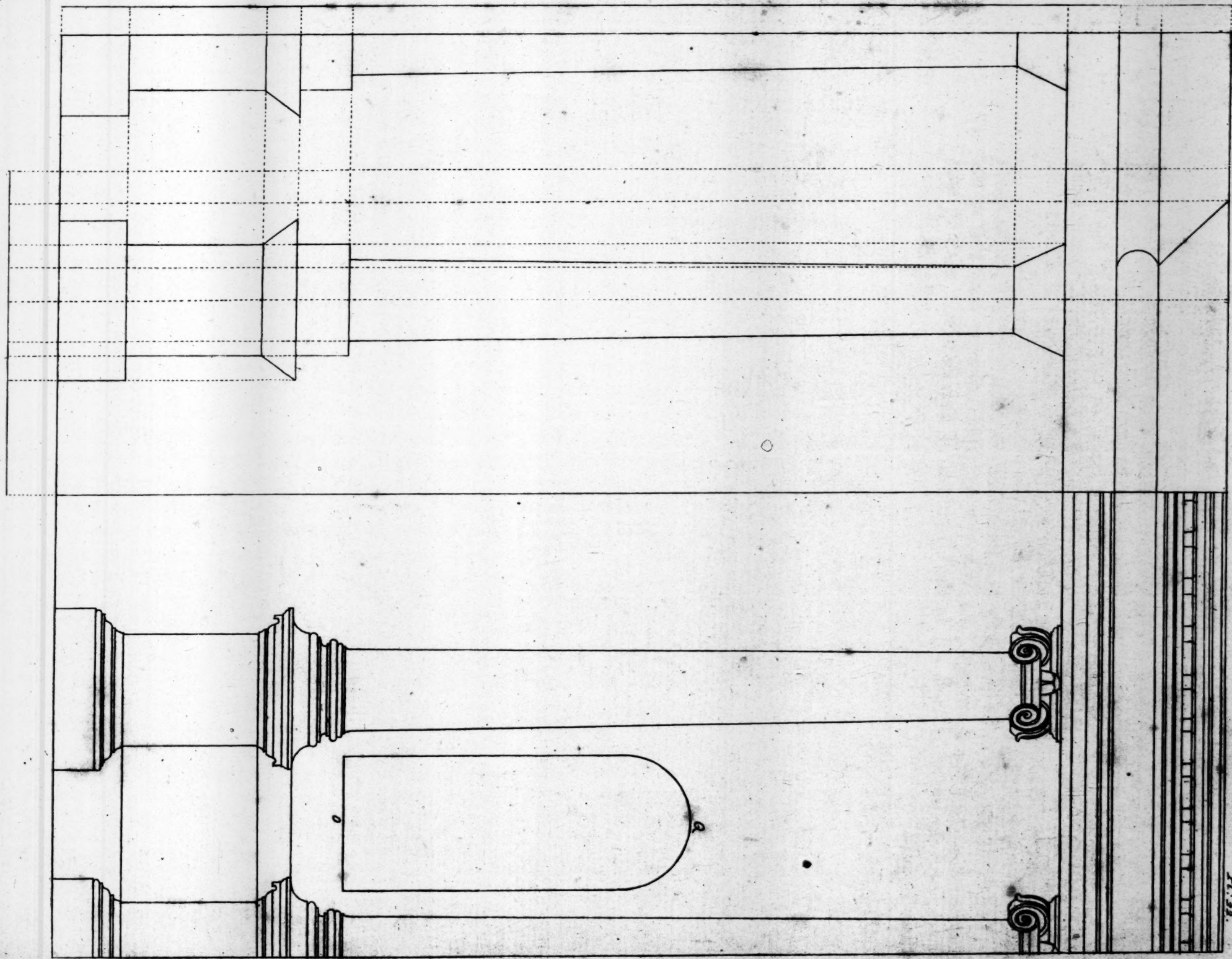
Therefore to place a Niche within the following Colnade in the lesser Inter-columnation, find out the Height of the opening of the Door, represented by BA, or MC, see where it transversally fits upon the Lines of Proportion, suppose to 6, 6, and 3, 3; then set the Instrument as directed to form Niches of this Order, and with the same transversal Space 6, 6, and 3, 3, that gave the Height of the said opening, place one Point of your Compasses at C, to mark the Intersection O, for the Height of the Niche: with the same transversal space you'll also find out the Width.

And as Windows are rais'd either higher, or lower from the Floor, it would be difficult to fix a method to place them; therefore observe the foregoing general Rule, and make the upper part of their opening meet directly with that of the Door, plac'd within the said Colnade; Windows being but a kind of Door, situated above the Floor to give light, and form'd by the same Directions.









OPERATION XX.

To place Niches within Colonnades with Pedestals.

TO place Niches within the following Colonnade with Pedestals, find out the Height of the opening of the Door, then set the Instrument as directed to form Niches of this Order, and take the distance from the upper part of the opening of the said Door to the *Lifella*, or Circure of the Bases of the Columns, that is, the distance A O; see where it transversally fits upon the Lines of Proportion, suppose to 7, 7, and 6, 6, with which form the Niche.

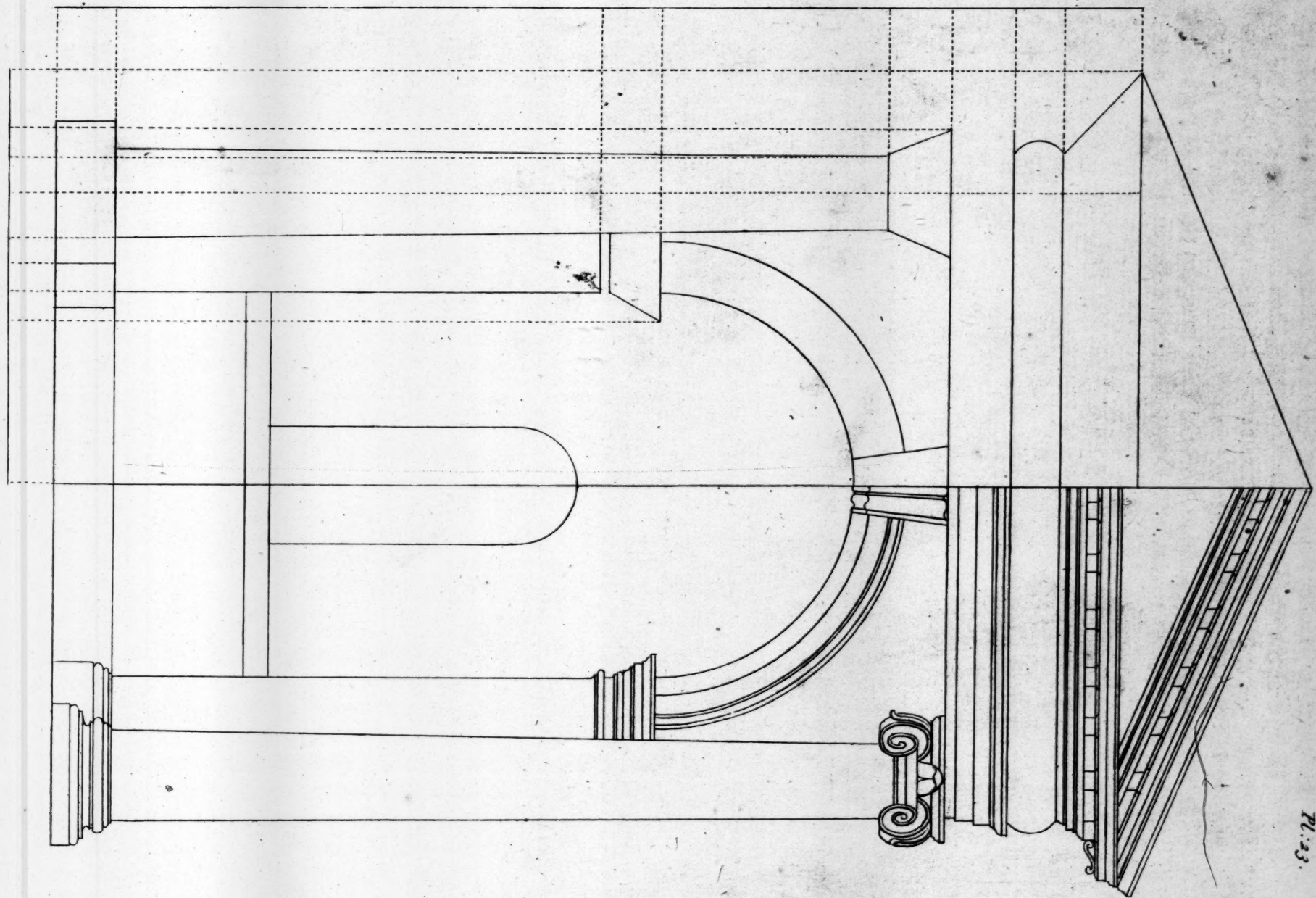
Windows are also to be plac'd by the same method, observing always to make the upper part of the opening of the Window correspond directly with that of the Door, and the lower come down to the Cimaflum of the Pedestals, making that their Limits.

OPERATION XXI.

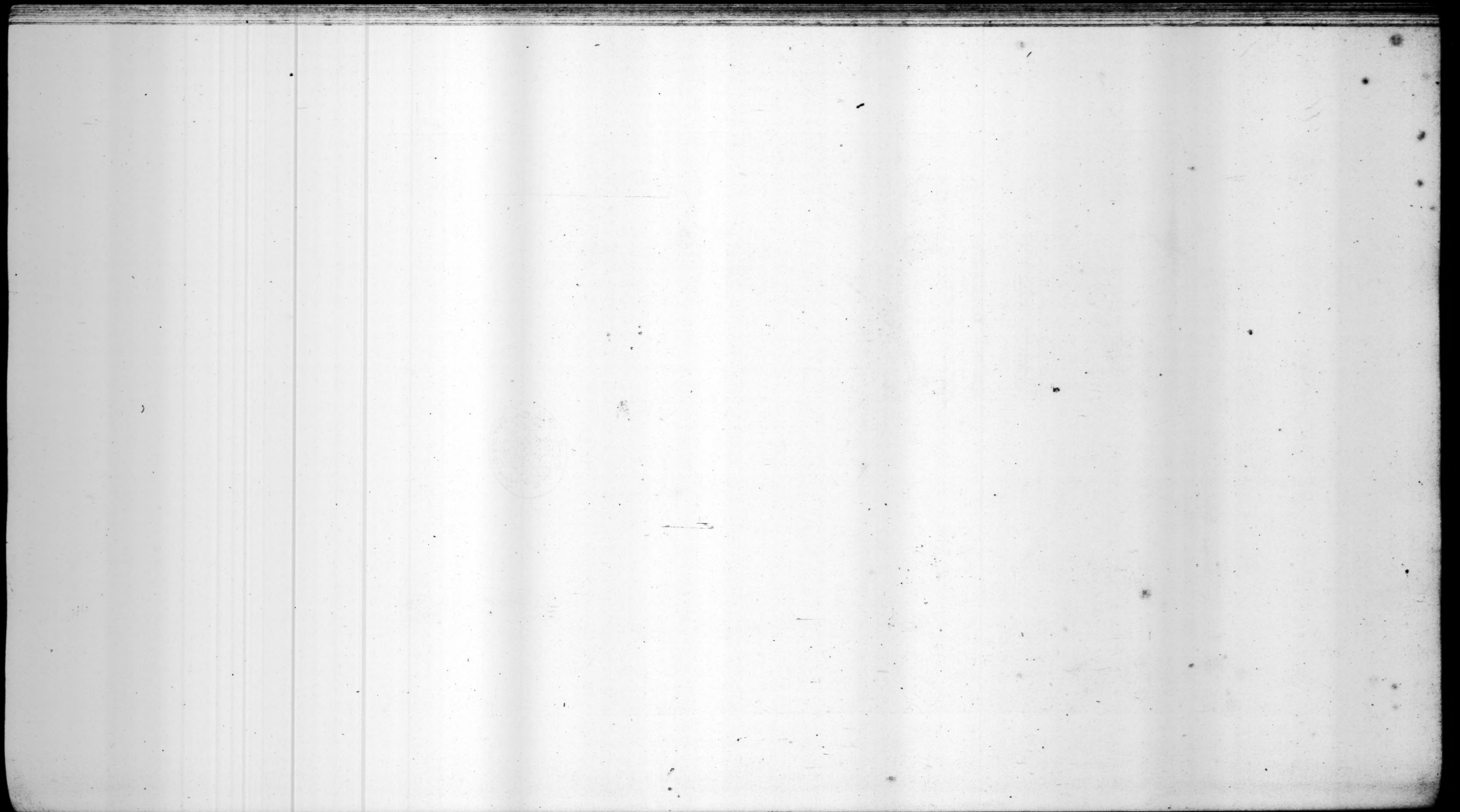
To place Niches within Arches without Pedestals.

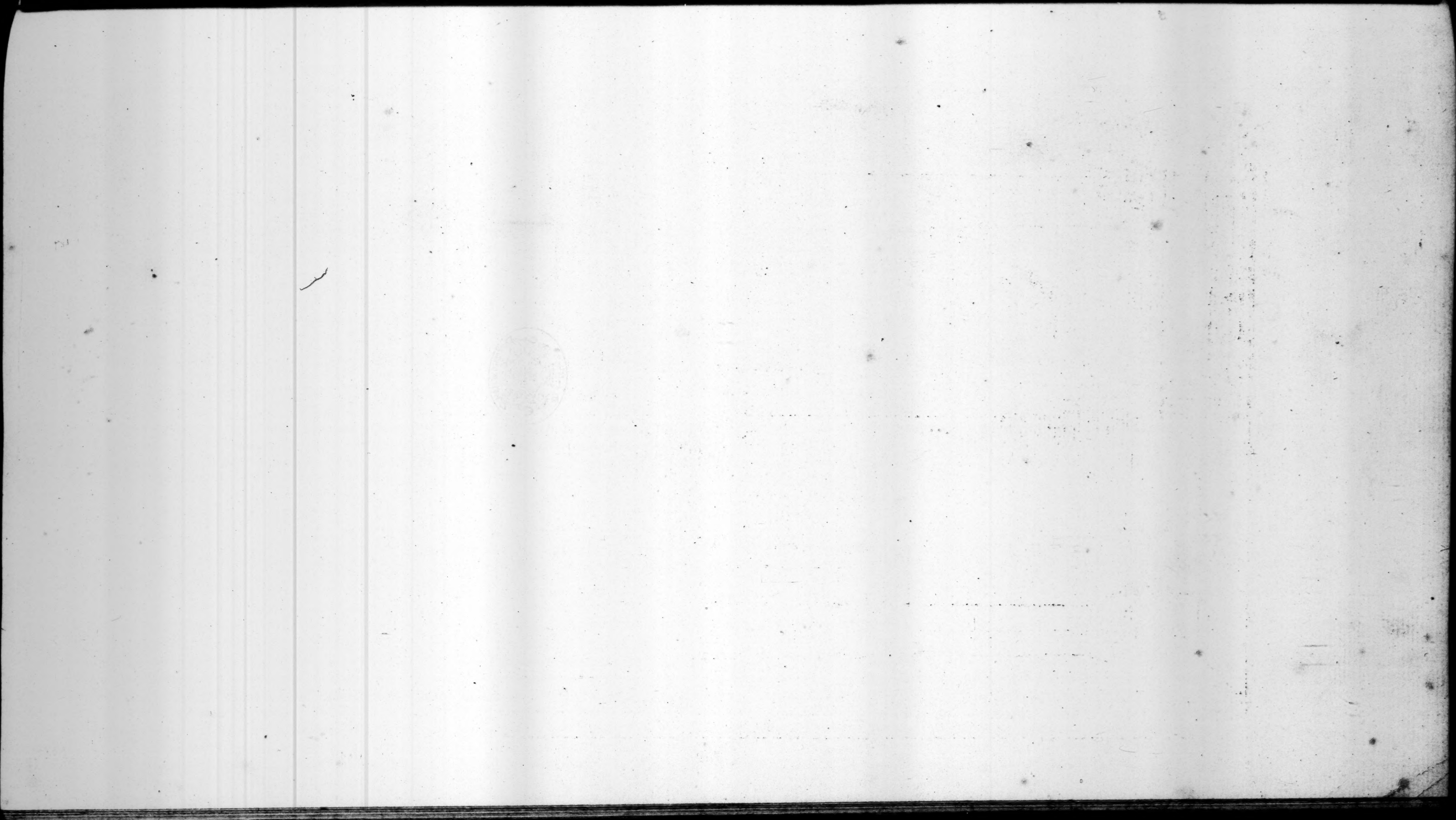
TO place a Niche within the following Arch without Pedestals, find out the Height of the opening of the Door that should be plac'd within the said Arch, see where it transversally fits upon the Lines of Proportion, and with the same transversal space form the Niche.

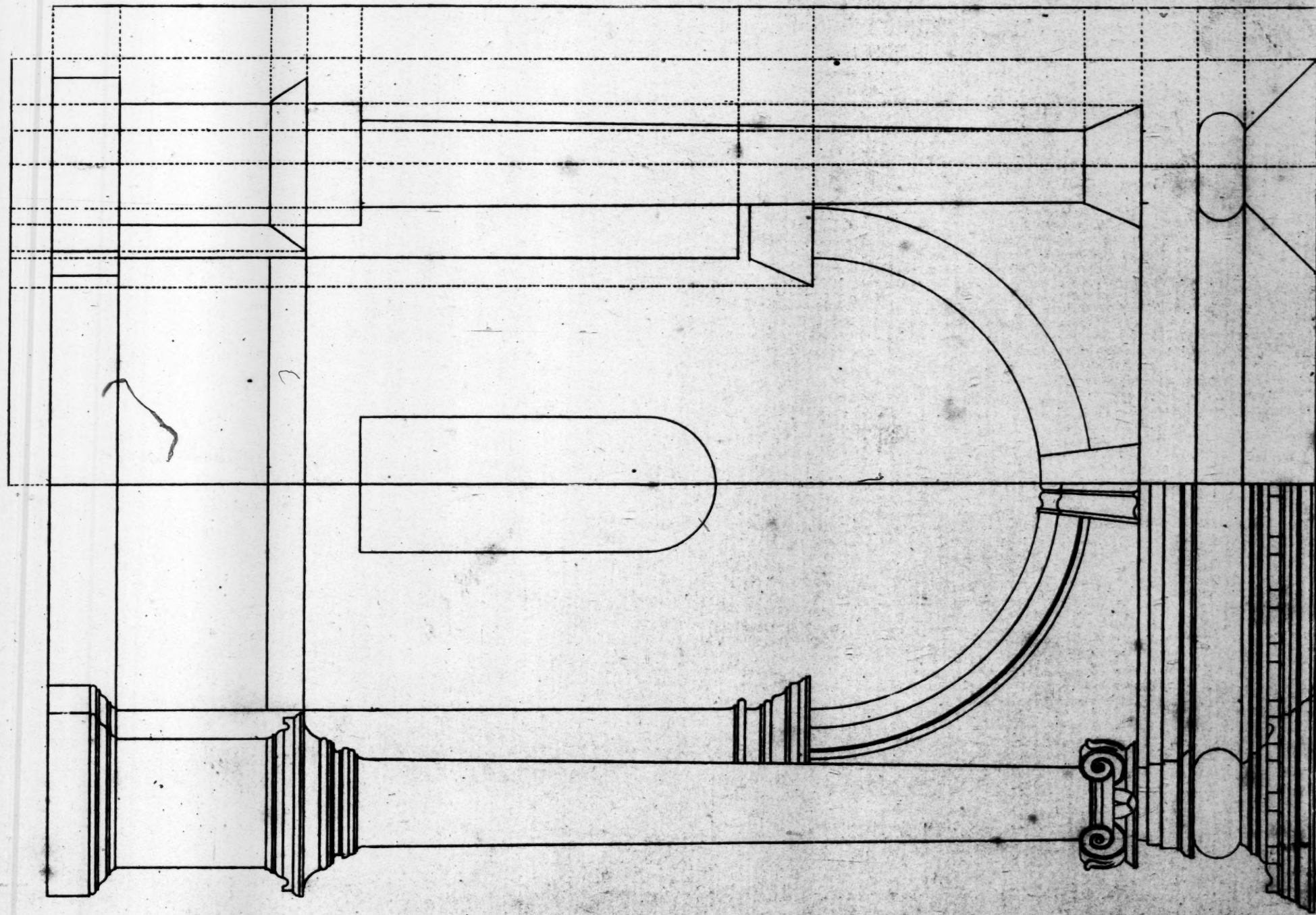
If Windows are required, observe always to make the upper part of their opening correspond with that of the Door, which is sufficiently explain'd in the foregoing Operations.



Pl. 23.







Pl. 24

OPERATION XXII.

To place Niches within Arches with Pedestals.

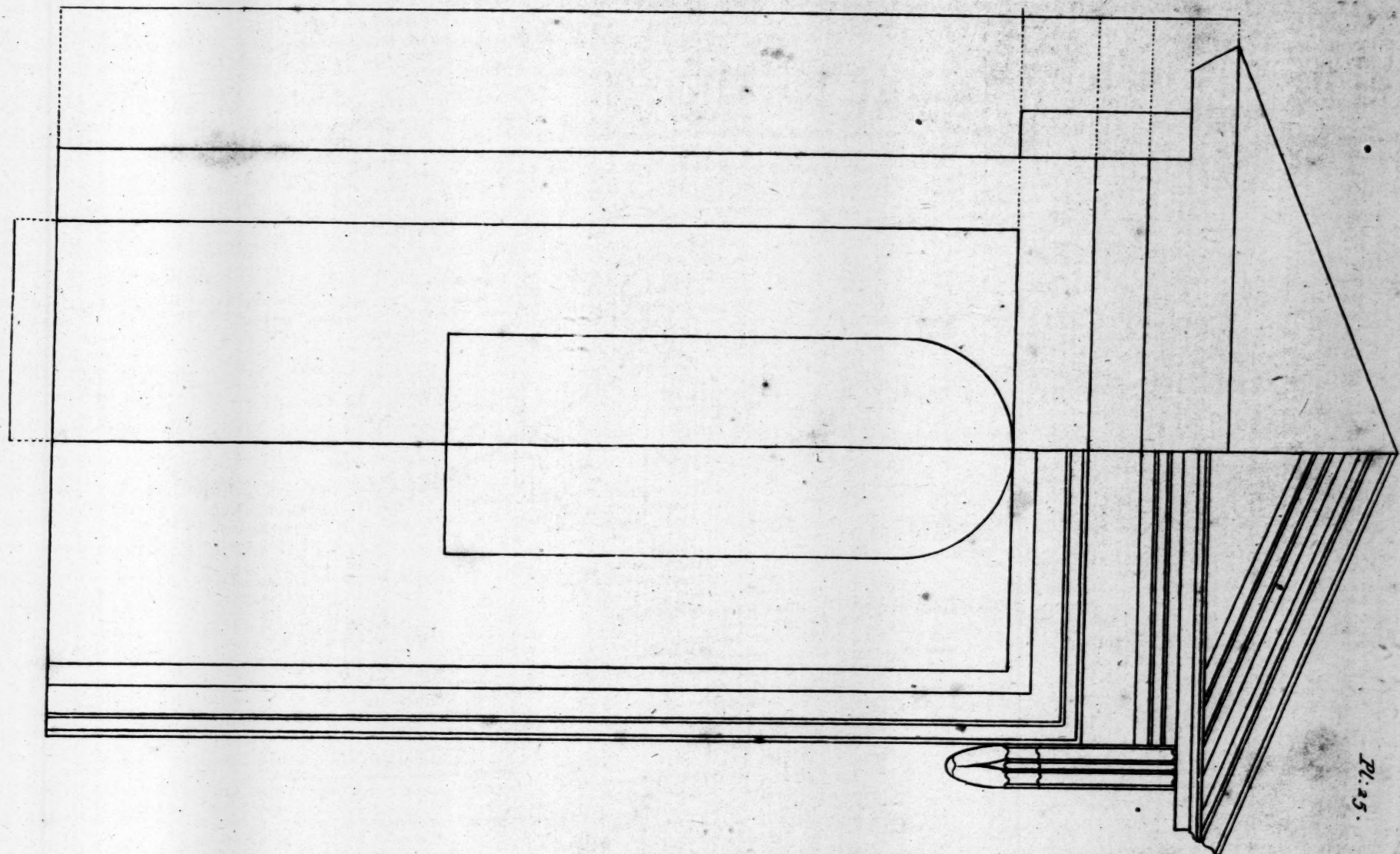
THE same method serves here, to place Niches within Arches with Pedestals, as did, in the foregoing Operation, to place Niches in Colonnades with Pedestals: therefore find out the Height of the opening of the Door, and take the distance from the upper part of the said opening, to that of the *Lissella* or Cincture of the Bases of the Columns; then set the Instrument as directed to form Niches of this Order, and with the same transversal Space, that serv'd to form the Door, form the Niche, which will be proportional to the said Arch.

The method to place Windows here is the same as that given to place them in Colonnades with Pedestals, which is sufficiently explain'd in the foregoing Operations; observing to make the lower part of their opening meet directly with the Superficies of the Cimaalum of the Pedestals, as it is there directed.

OPERATION XXIII.

To place Niches on each side of Doors.

BY the foregoing Directions any one may easily comprehend how to place Niches on each side of Doors, without any regard to Colonnades and Arches, as the same transverse Space that serv'd to form the following Door, serves also to form the Niches or Windows if requir'd.



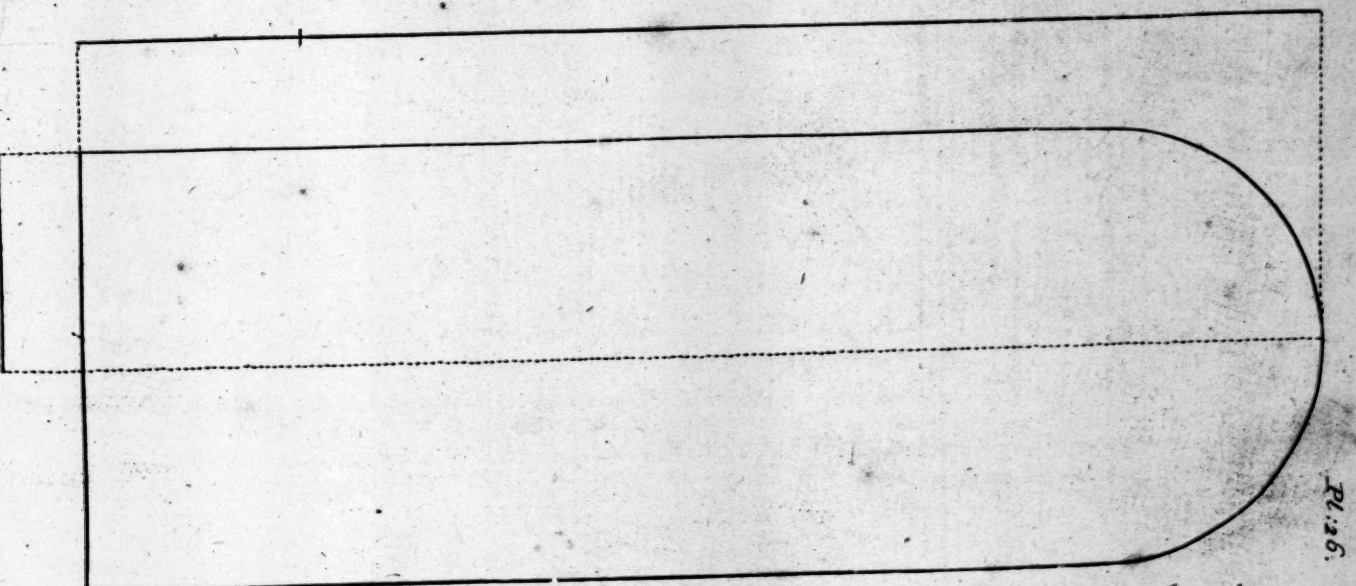
Pl. 25.



OPERATION XXIV.

To place Niches in plain Fronts.

TO place Niches in a plain Front; first, set the Instrument as directed to form Colonades with Pedestals of this Order; take the Height of the given Front, and see where it transversally fits upon the Lines of Proportion, suppose to 18, 18; secondly, set the Instrument to form Doors of this Order, observing to open the moveable Leg to that point only that marks the Height of the opening of the Door; then take the transversal Space 18, 18, with which fix one Point of your Compasses at the bottom of the said Front, to mark the Height of the Niche with the other; lastly, set the Instrument to form Niches, and with the same transversal Space 18, 18, form the Niches, which by this method will be justly proportion'd to the Front.

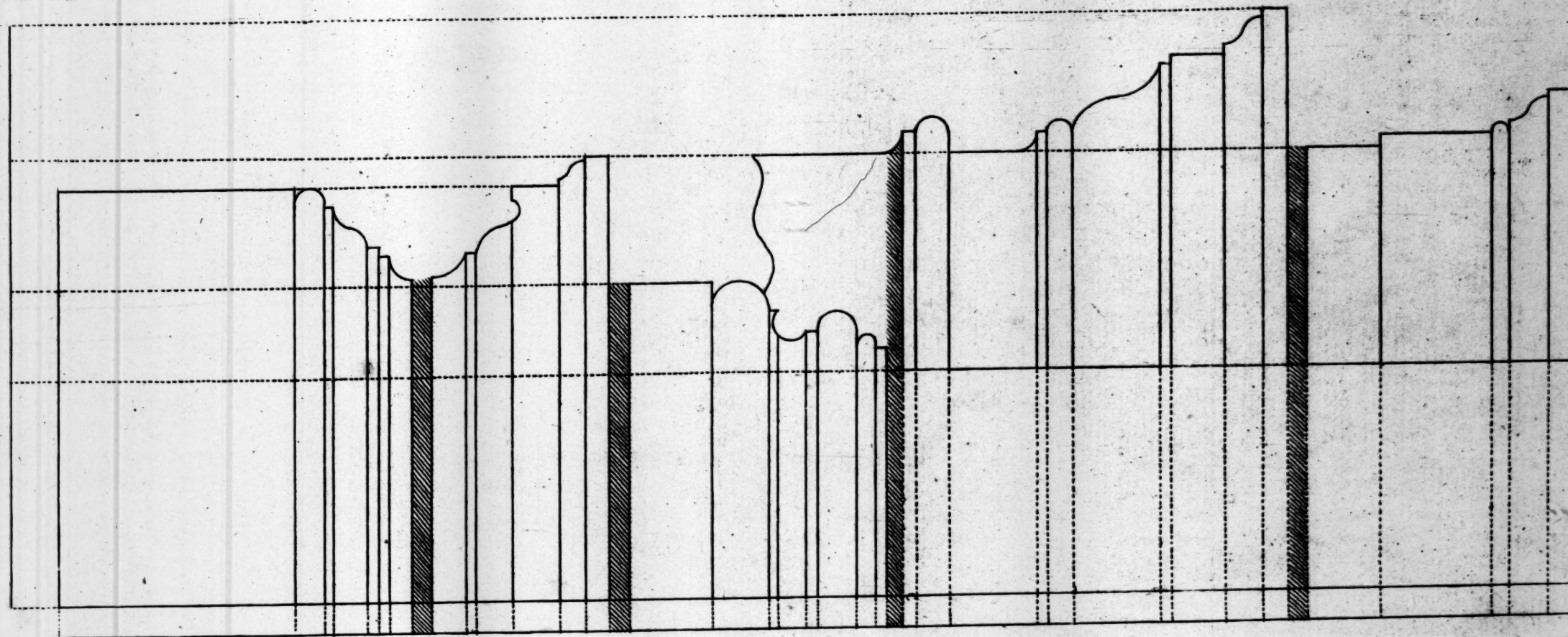


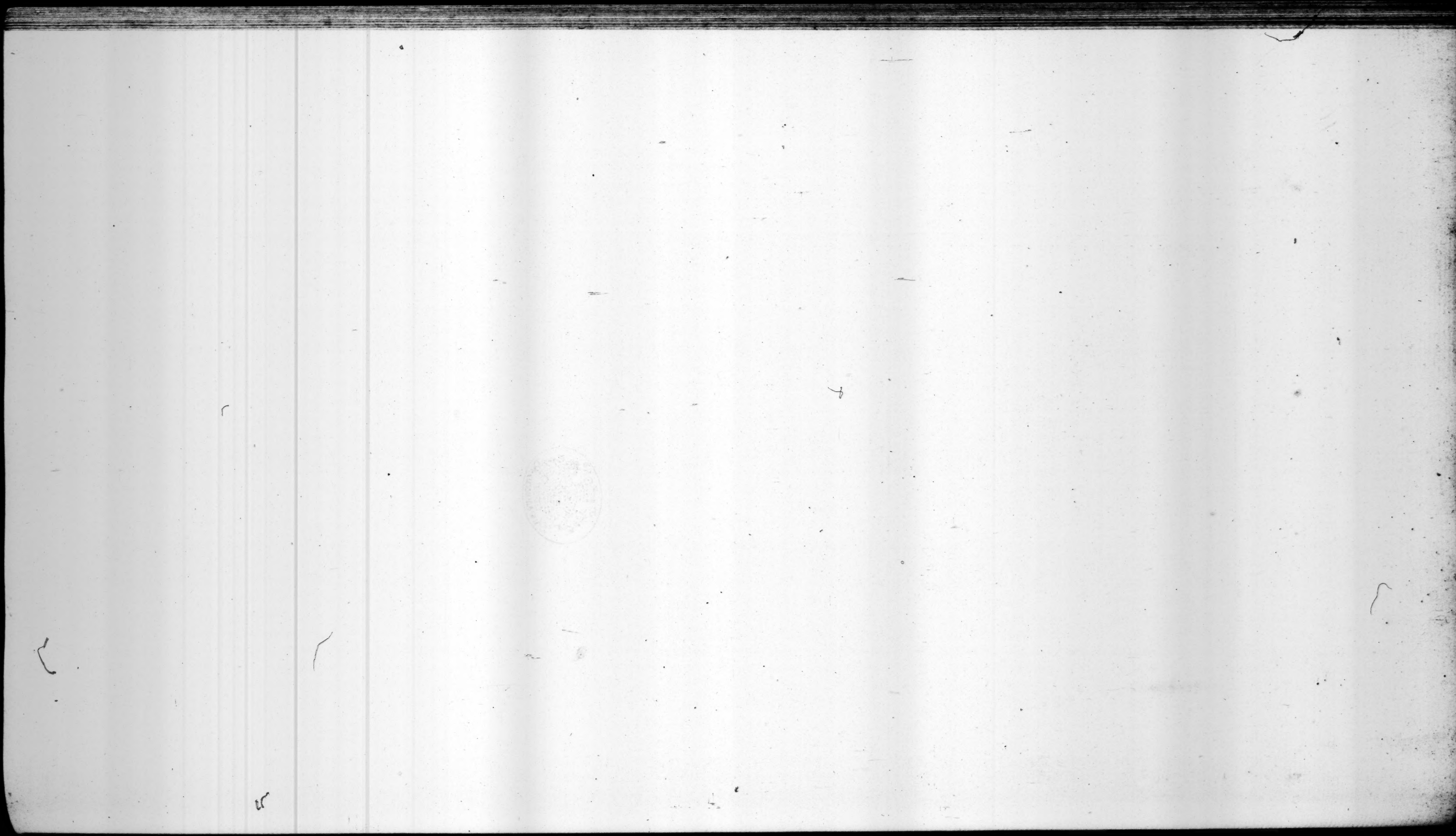
OPERATION

OPERATION XXV.

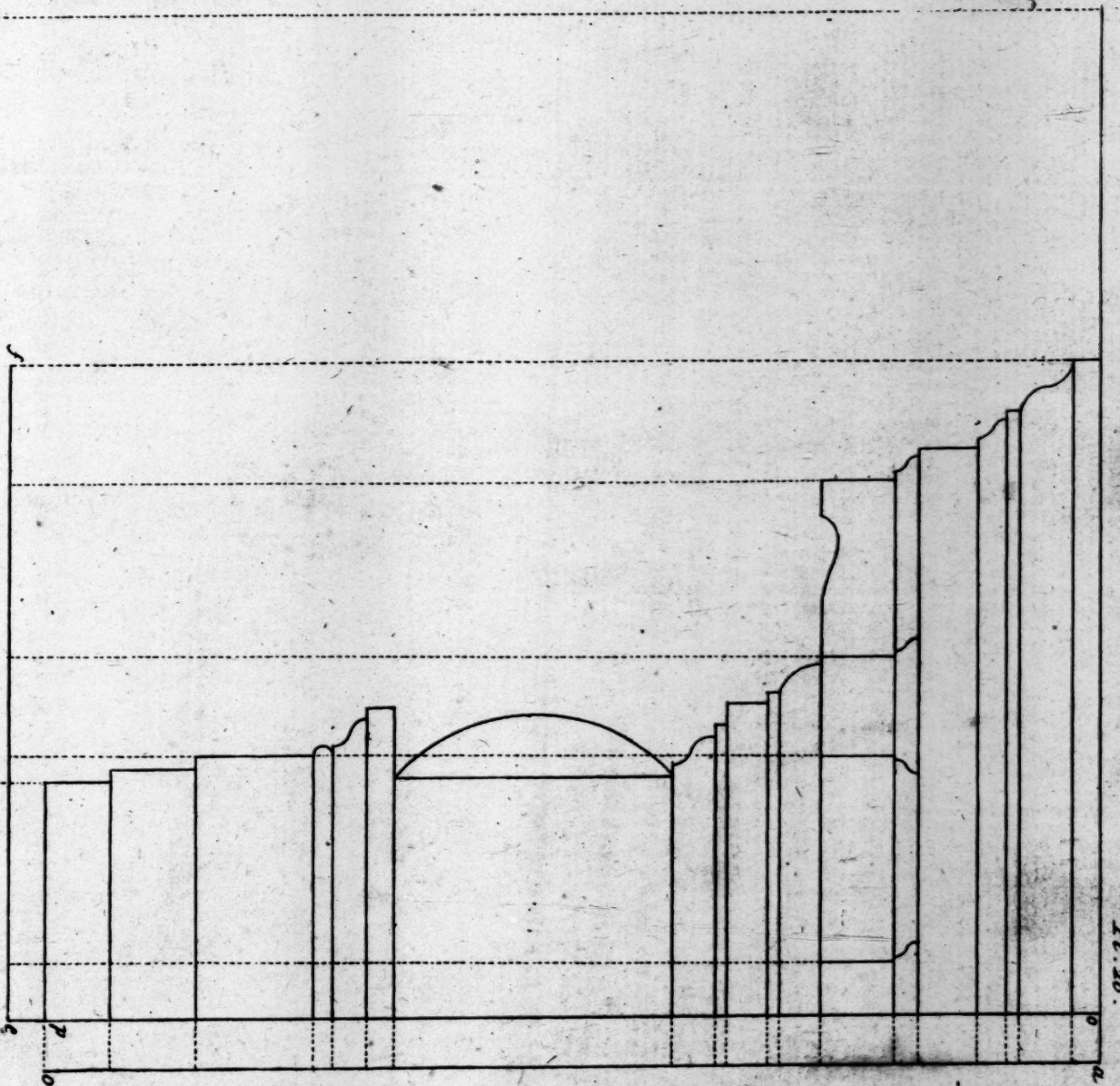
A Caution in the following Basements.

I T has in the foregoing Orders been said, that the Width or Projecture of the Cimaſium of Pedestals was to serve for that of the Base; but here you must observe, that on the contrary the Cimaſium projects more than the Base, as you may see by the prick'd Line that falls from the *Fascia* of the following Cimaſium, directly down to the Plinth or Square of the Base; therefore the Projecture of the *Fascia* in this will give that of the Bases of the Pedestals, or may be mark'd with other Points in the same Spaces for the Projecture of the Cimaſiums.

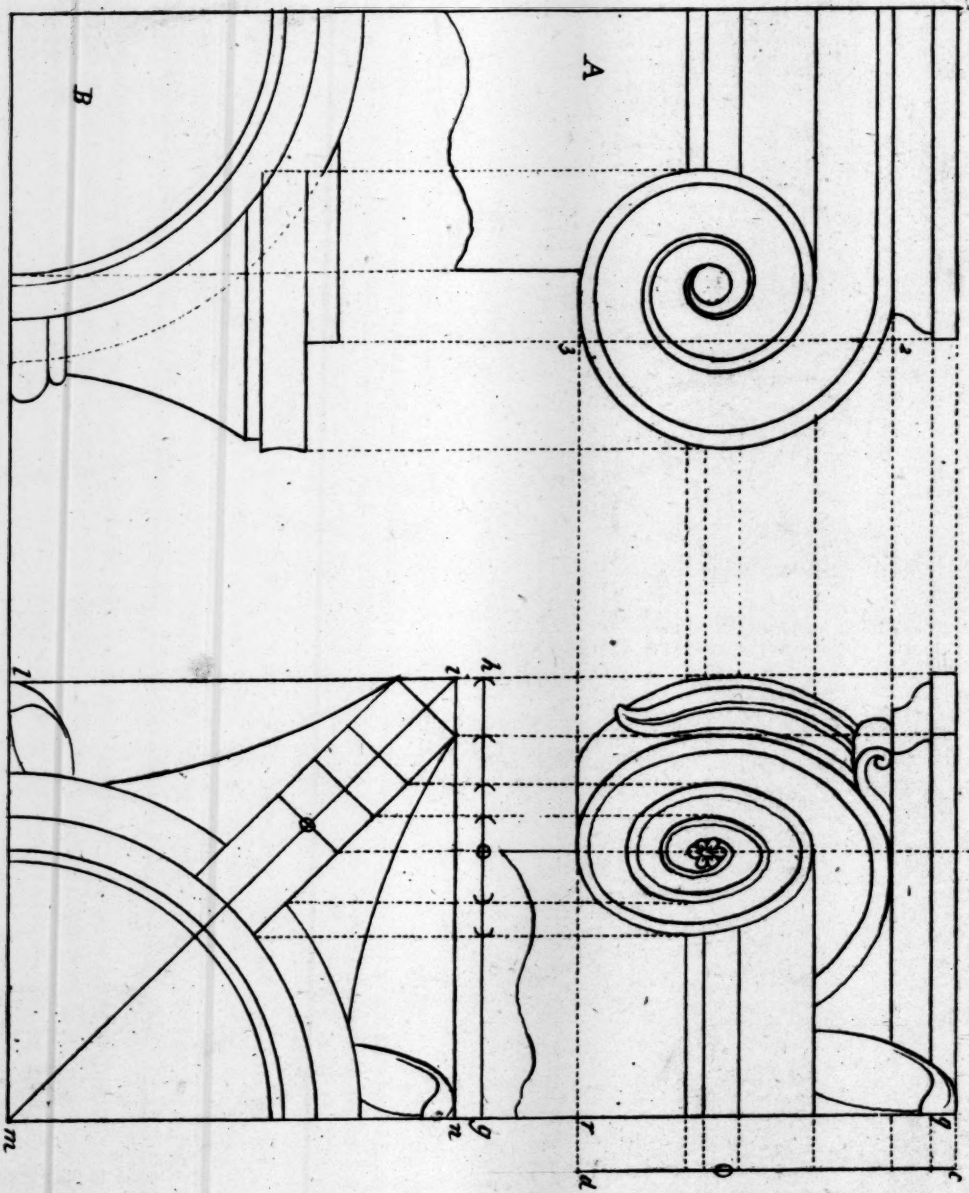








Pl. 28.



OPERATION XXVI.

An Observation upon the Ionick Capital.

IT is proper here to observe, that the *Ionick* Capital differs entirely from the former, by reason of the Volute, which being angular, the Profile can be represented in no other than an oval form, and in Front as the opposite Capital A; Rules for making of which shall be given at the latter end of this Work.

Therefore to form the angular Voluta, find out all the necessary Points for the Heights, mark'd upon the perpendicular Line D C, and those for the Widths upon the horizontal Line G H; then transfer the Line G H in Q X, likewise A S and G O in A T; with all the other Points that serve for the diminishing of the Voluta and its Center, mark'd with a small Circle upon the horizontal Line G H, that also shews the Shaft of the Column; with these Points begin at E to draw the Volute; and that the parts of this Capital may be more plainly seen, the Perpendiculars are made to fall in the Square N I L M, which will give a Plan of all its Parts.

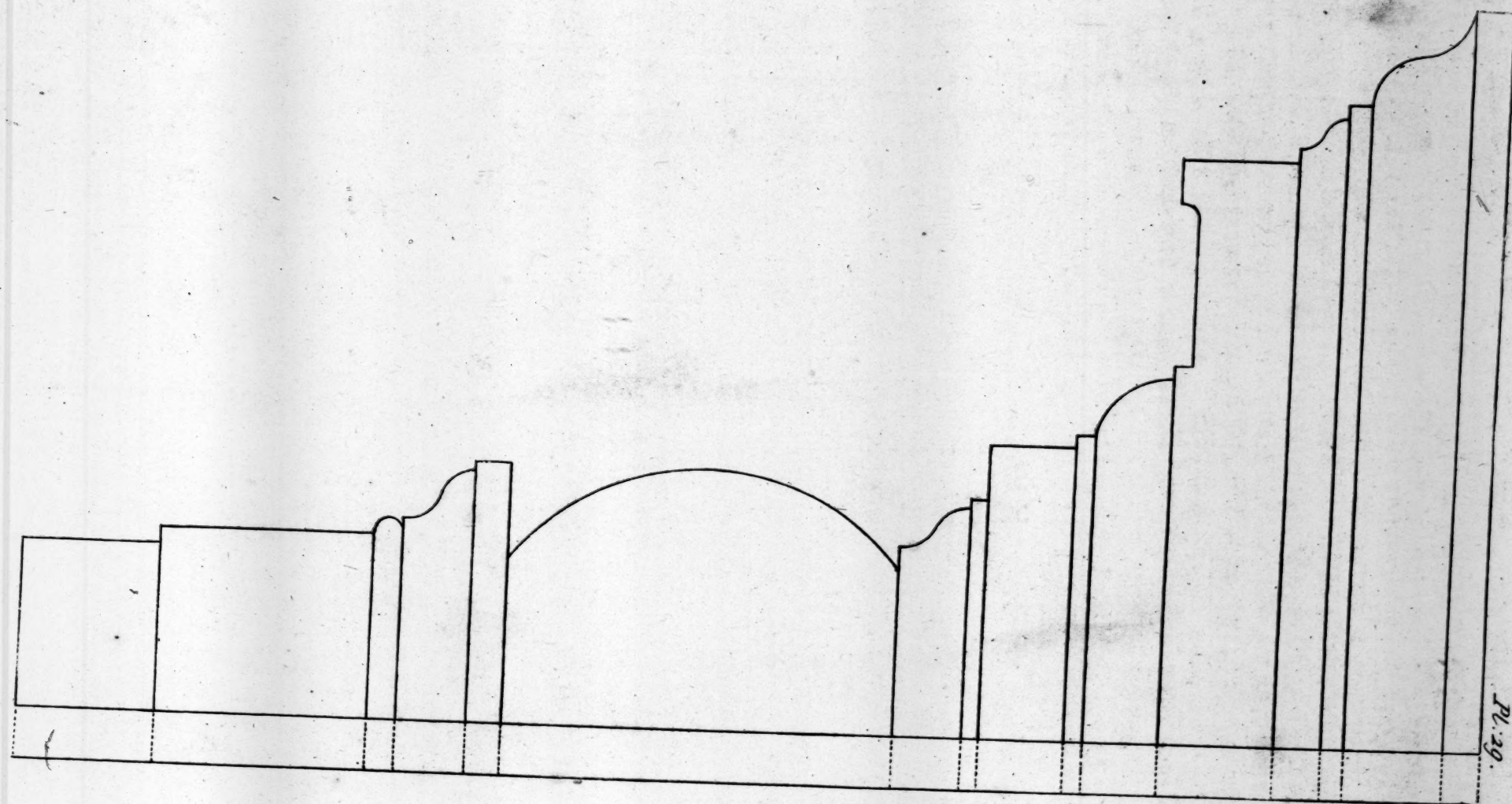
I

OPERATION

OPERATION XXVII.

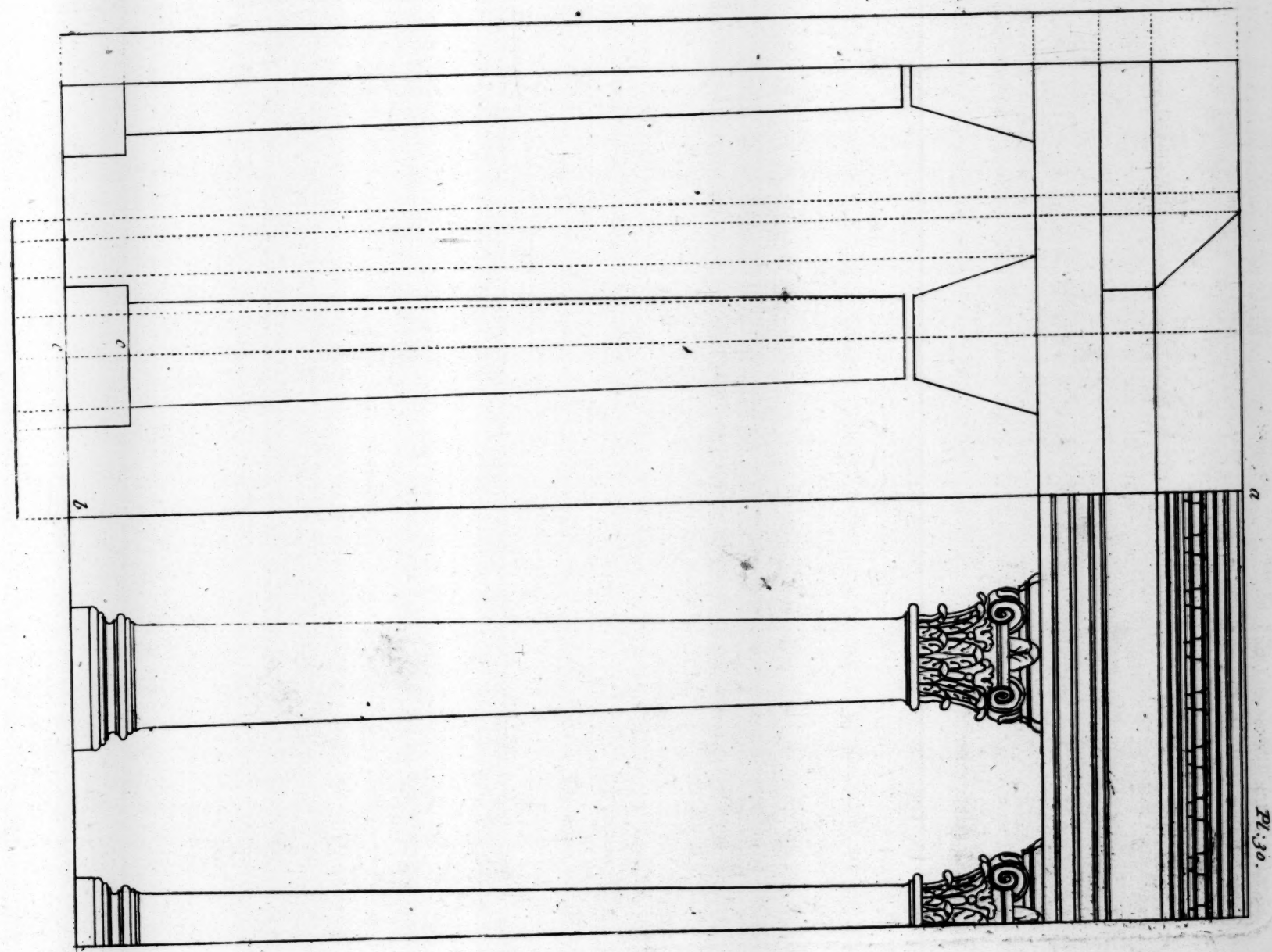
To form the Orders with their Members as large as you please.

Although the Instrument is but small, you may nevertheless form the Orders, particularly their Members, as large as you please; for if a Cornice should be wanted larger than what the Instrument can open to, you must then only take the half, third, or fourth part of the Height of that required, and form one less, by which a larger Cornice may easily be made: as for Example, if the following Cornice has but half the Height and Width of that you intend to form, you must then double every Part, and give the Architrave, Frieze, Projecture, and all the other Members, twice the Height and Width of that in the Plate annex'd, by which method you may not only form Cornices, but any other Part as large as you please.









OF THE
COMPOSITE ORDER.

OPERATION XXVIII.

To measure the Orders.

AS I have in the foregoing Operations taught how to form the Orders, and place Doors, Niches, and Windows within Colonnades and Arches; so it is proper, to make this Work more useful, that I should here teach how to measure them with the Instrument, to know the quantity of their several Parts, and place them in great Works, without which it might justly be called imperfect.

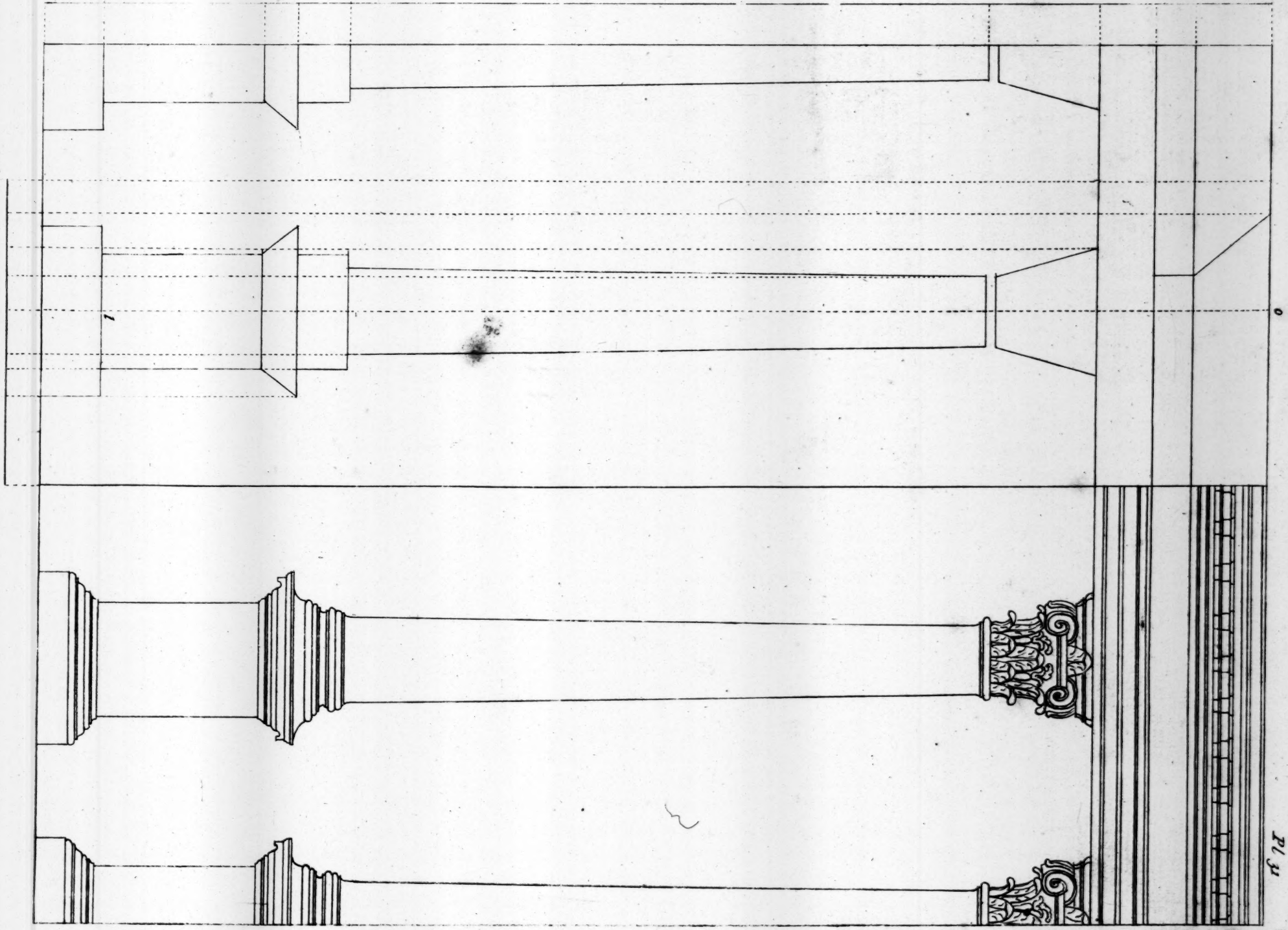
Therefore to measure the Bases of the Columns, Shafts, Capitals, and Cornices, or even the smallest Part of the following Colonnade, the Height of which is to be, for Example, eighteen Foot; take the Height BA, *i. e.* that of the Colonnade, with a Pair of Compasses, fit it transversally upon the Lines of Proportion to 18, 18, and fasten both Legs of the Sector with the four Screws; when the Instrument is thus set, take the Height of the Base of the Column EO with a Pair of Compasses, see where or to what Numbers it transversally fits upon the said Lines of Proportion, suppose to N^o. 6 and 10 10 Points, which gives the Height of the Bases of the Columns ten Inches: for the Height of the Capital, measure also one of them, and see where it transversally fits upon the same Lines of Proportion, suppose to 1, 1, and 9, 9, which gives the Height of the Capital, one Foot nine Inches: every other part is to be in the same manner measured, and fitted transversally upon the Lines of Proportion; by which method you may not only know the Height and Width of every Part, but also the Space between Column and Column.

OPERATION XXIX.

To measure the Orders by another method.

TO measure the following Colonnade, the Height of which is to be seventeen foot; take the Height of the said Colonnade with a Pair of Compasses, fit it transversally upon the Lines of Proportion to 17, 17, fasten both Legs with the Screws; when the Instrument is thus set, place one Point of your Compasses at O, open the other to R, and see where that fits transversally upon the said Lines of Proportion, suppose to 16, 16; subtract 16 from 17, and 1 remains, which is one Foot, the Height of the Bases of the Pedestals: all the other Parts must in the same manner be measured, fitted transversally, and subtracted, to know their several Heights and Widths.

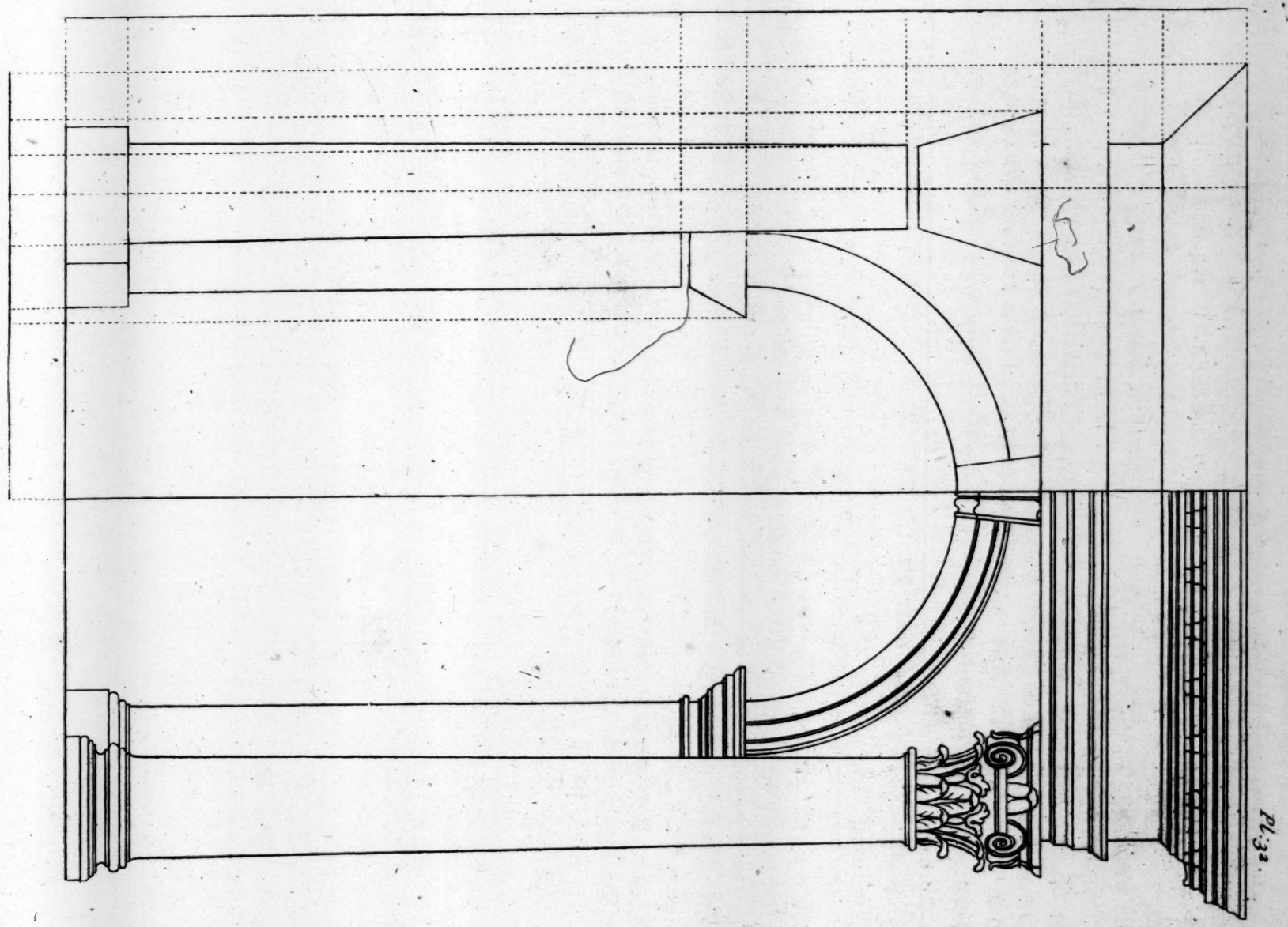
OPERATION



Pl. 3







Pl. 32.

O P E R A T I O N . XXX.

To measure the Orders after a more exact manner.

THE large Draughts are undoubtedly much juster in the proportion of their parts than the small, and therefore Designs ought to be made as large as possible; but as they are sometimes small, it is proper I should teach how to measure them, although ever so small, after a more exact manner than what has been hitherto shewn.

Therefore to measure the following Arch, first draw a Line as long as the Instrument can contain within the opening of the two Legs, upon which Line mark all the Heights of the said Arch with the Instrument; secondly draw another, and thereon also proportionally mark the Widths, and by some of the foregoing methods measure every part mark'd upon the said Lines, and then transfer them, one after another, upon the small draught, by which method they will be much juster than if you had taken them directly from the Draught.

But Arches or *Archivolti* must always be reduced in the following manner to their Rectitude, before the Circumference can be measured; therefore open the Instrument in any manner you please, take the transversal Space 7, 7, and also that at 11, 11; mark these both a part, and keep them for a general Rule to measure the Circumference of any Arch or Archivolto of half a Circle.

To measure the Circumference of the following Arch, we will suppose its Diameter to be three Foot and an half, take the first transversal Space 7, 7, and fit that transversally upon the Lines of Proportion to 3, 3, and 6, 6 Points; the Instrument being thus set, take the second transversal Space 11, 11, and see where that transversally fits upon the said Lines, suppose to 5, 5, and 6, 6, which gives the Circumference of the said Arch five Foot six Inches: you may by the same Rule measure the Circumference of any Room.

K

O P E R A T I O N



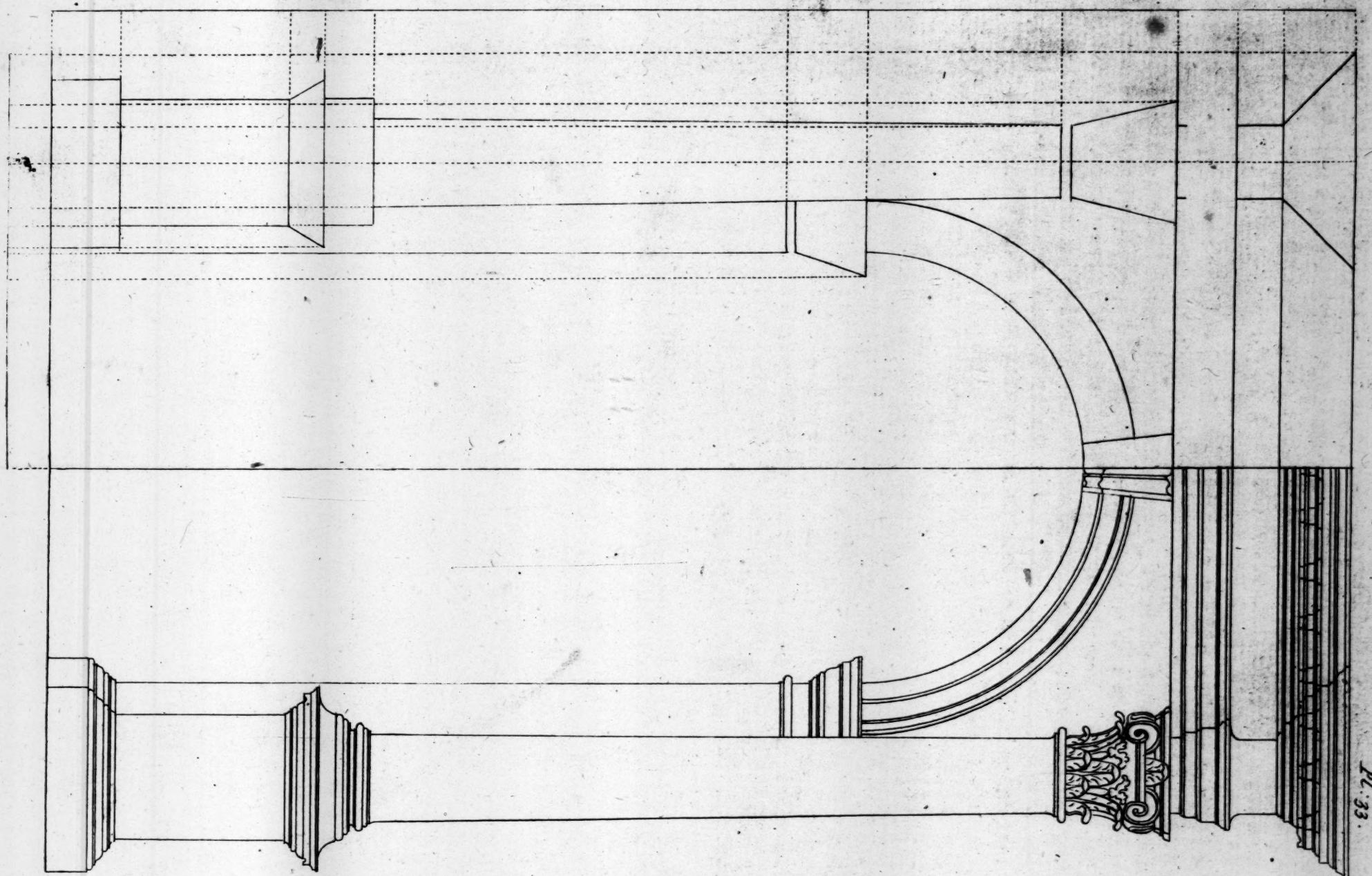
OPERATION XXXI.

A Caution in measuring the Orders.

HERE you are to take notice, that when the Height of any Order, exceeds in Feet the Divisions of the Lines upon the Legs, take but the half, third, or fourth part of the said Height, and make every Number serve for two, three, or four Foot, as necessity may require.

As for Example, if the following Arch is thirty Foot high, it would be impossible (to measure the said Arch) to fit it transversally upon the Lines of Proportion, as the Division extends but to 18; you must therefore fit the said Height to 15, 15, as it is half the said Height; the Instrument being thus set, take the Height of one of the Pedestals with a Pair of Compasses, and see where that fits transversally, suppose to 3, 3, and 2, 2, add these Numbers together, and they will make 6, 4, the Height of the said Pedestal six Foot four Inches: all the other Parts must in the same manner be measured to know their Heights; and when a third or fourth part has been taken, they must then be trebled or quadruplicated, &c.

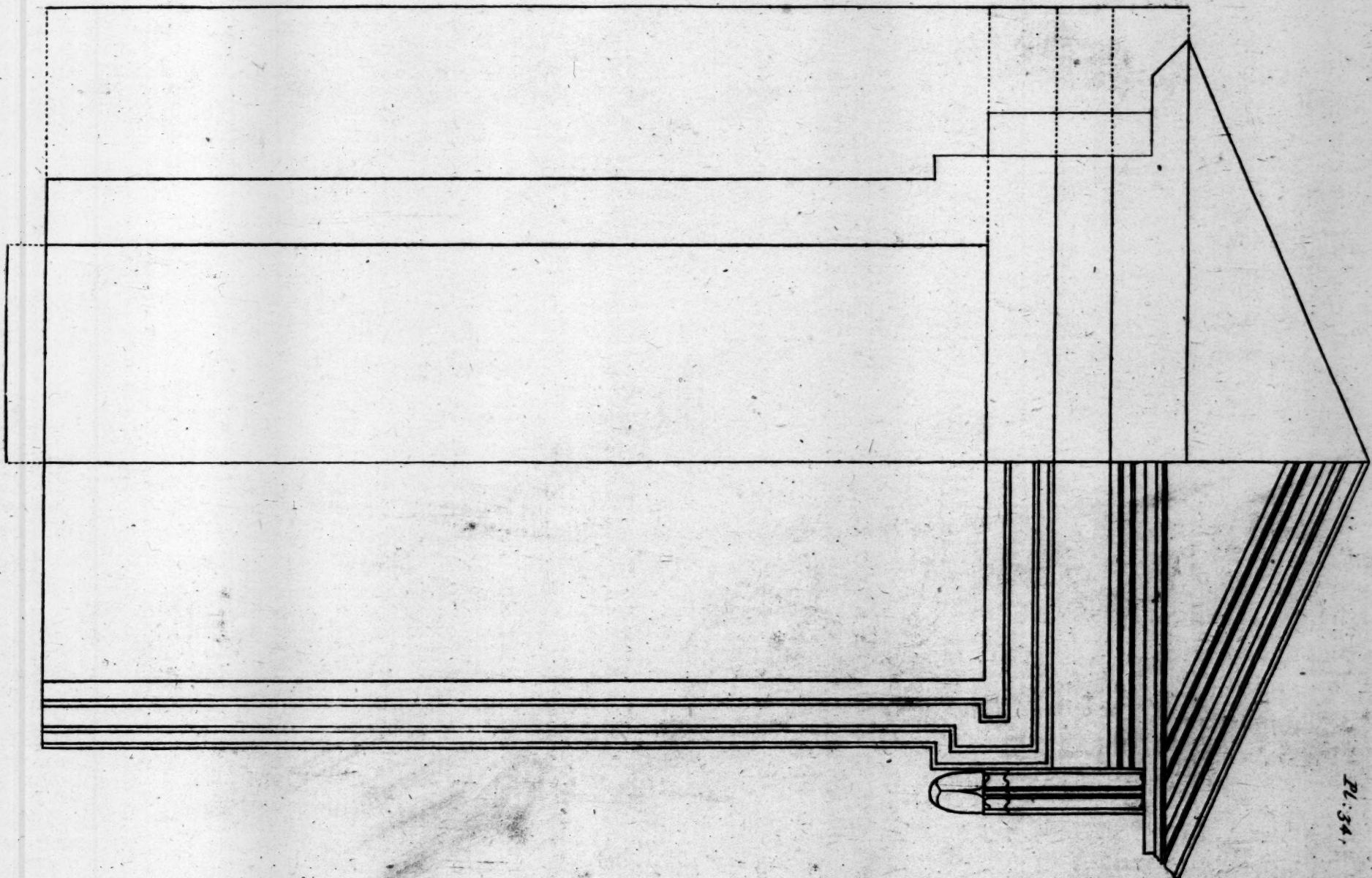
OPERATION
I



Pl. 33.







Pl. 34

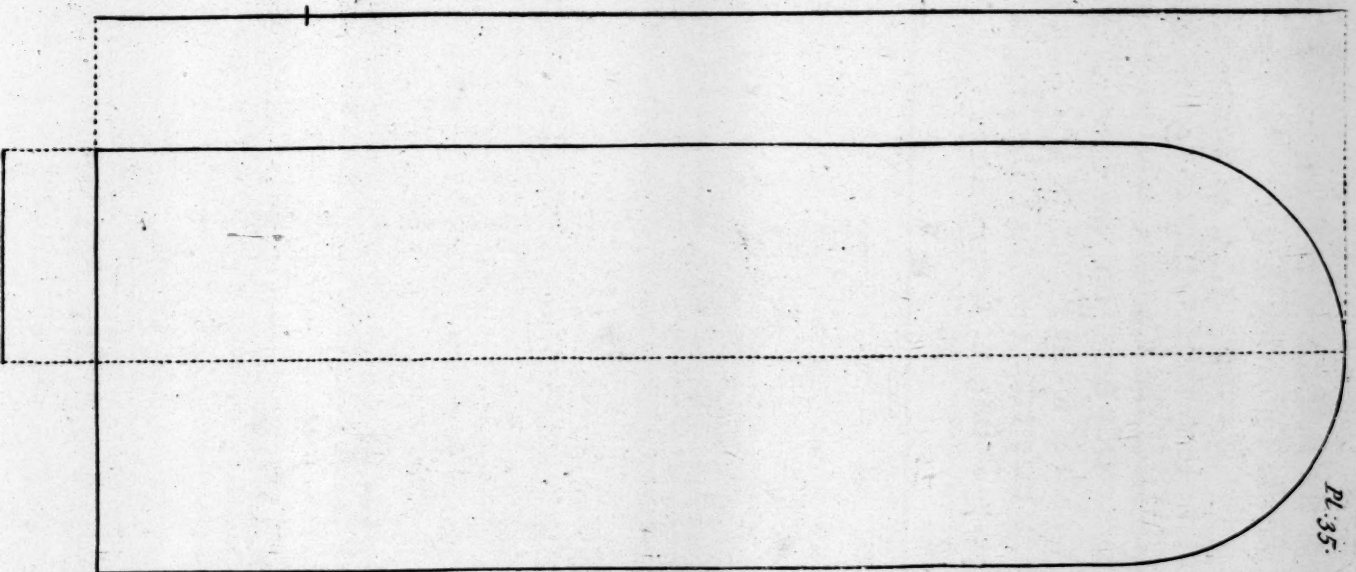
OPERATION XXXII.

A Caution in measuring the Orders.

WHEN the Draughts are so large as to exceed in Height the number of Feet that the Instrument can open to, only take the half, third, or fourth part of the said Height; as for Example, the opening of the following Door, which is five Foot high, if fitted transversally will exceed the Numbers 5, 5, of four Points; therefore only take half the said Height, and fit that transversally to 5, 5; when the Instrument is thus set, to measure the Height of the Cornice, take its Height with a Pair of Compasses, see where it transversally fits upon the Lines of Proportion, suppose to 1, 1, and 2, 2, half of which is seven Points, or seven Inches, the Height of the said Cornice; otherwise you may take only half the Height of the said Cornice, which will exactly fit to 7, 7 Points, or seven Inches.

OPERATION

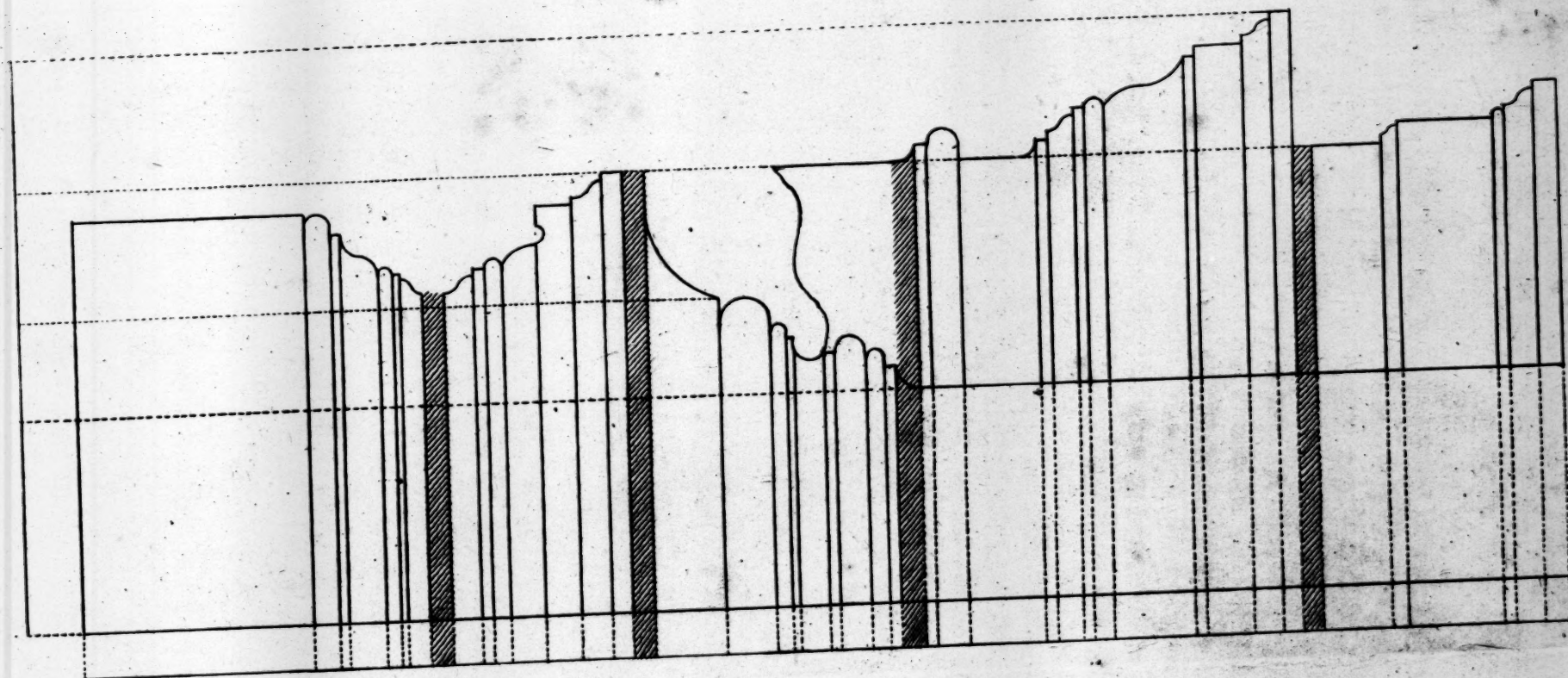
OPERATION XXXIII.

A Caution in measuring the Orders.

BUT when it happens, that you are oblig'd to measure with Inches and not Feet; you must then make every Number serve for an Inch, as it did before for a Foot, because that if the following Niche is but ten Foot high, it would be impossible to fit that transversally upon the Lints of Proportion to 10, 10 Points, to measure its Width, by reason of the proximity of these Points to the Center; and therefore must be fitted to Number 10, 10, to make every Number serve for an Inch, and the Points between for twelfths of an Inch; when the Instrument is thus set, take the Width of the said Niche, see where it transversally fits, suppose to N^o. 3, 3, and 6, 6 Points, for which you must reckon three Inches and six twelfths, the Width of the said Niche: you may by the same rule measure any other part.

OPERATION





Pl. 36.

OPERATION XXXIV.

To vary the Members.

AS we are sometimes oblig'd to diversify the Members, either for Beauty or to lessen Expence, and place the Parts of one Order in another; so I will here teach how those Members are to be made proportional to the Parts of the Orders, wherein they are to be plac'd.

Therefore, when all the following Members are form'd, except the Base and Impost, if the Base of the foregoing Order is wanted here instead of the Base that belongs to the Column of this Order, mark the Height of the said Base with the same Numbers that gave the Height of the other Members, and set the Instrument as directed to form Bases of the Order you require; then take the Height of the Base with a Pair of Compasses, see where it transversally fits upon the Lines of Proportion, suppose to 6, 6, with which form the Base with the Members belonging to the said Order.

You may by the same method not only diversify the Bases, but also Imposts or any other part.

L

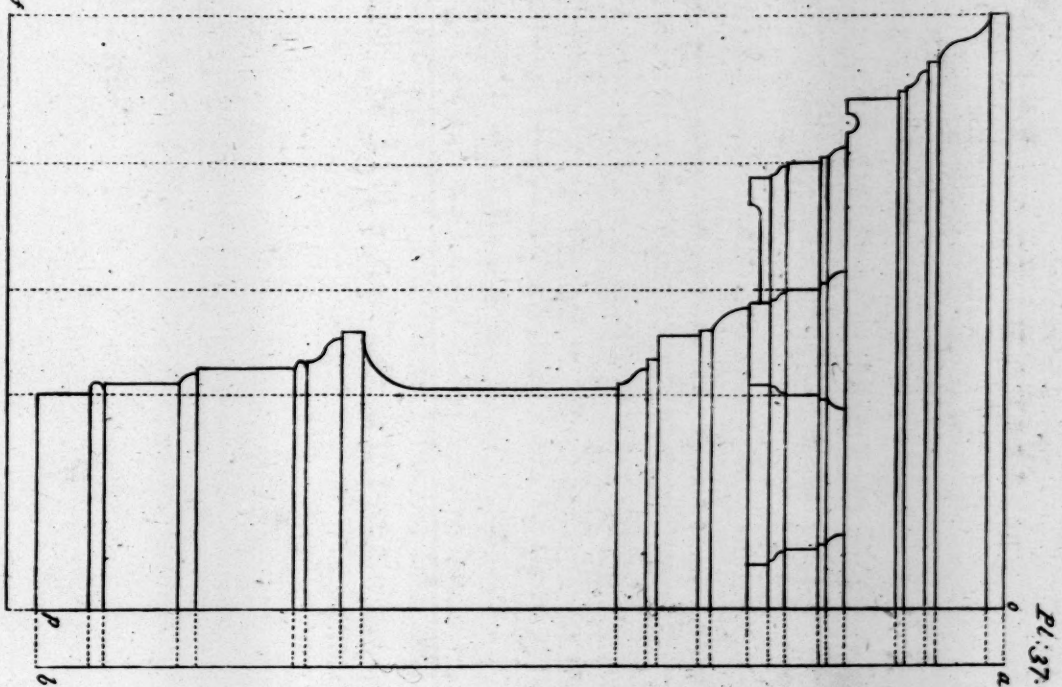
OPERATION

OPERATION XXXV.

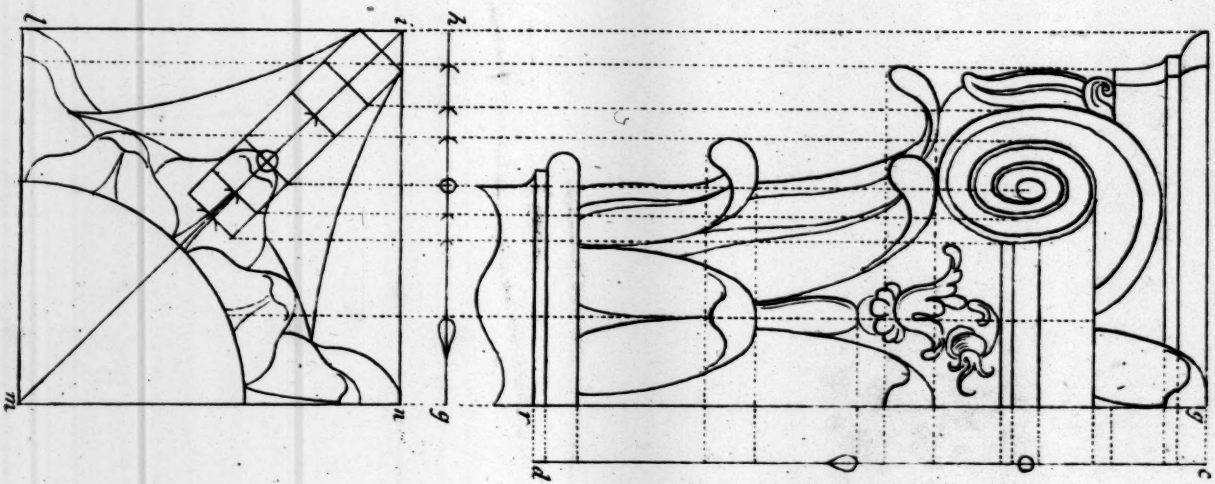
An Observation upon the Capital in the Composite Entablature.

THE following Cornice is so very easy to form, that it would be needless to say any more than what has been said upon that Subject in the foregoing Operations; I will therefore only observe, that when all the Heights of this Capital are mark'd with proper Lines, you must also mark the Widths upon the said Lines with a Pair of Compasses, which intersect upon the diminish'd part of the Voluta, and give the Projecture of the Leaves, as may be seen by the Perpendiculars; the small Circle upon the perpendicular and the horizontal Lines shews the Center of the Voluta with the Shaft of the Column; the small Pyramids, the Height of the Stem, upon which the Flower is to be; when all these Points are rightly disposed, you may form the Capital with a black Lead Pencil, and begin with the Horn, then the Voluta, the first and second Leaves, and lastly the Stem and its Flower, causing all the Perpendiculars to fall in the Square N I L M, which gives its Plan, as you see in the Example.

OPERATION

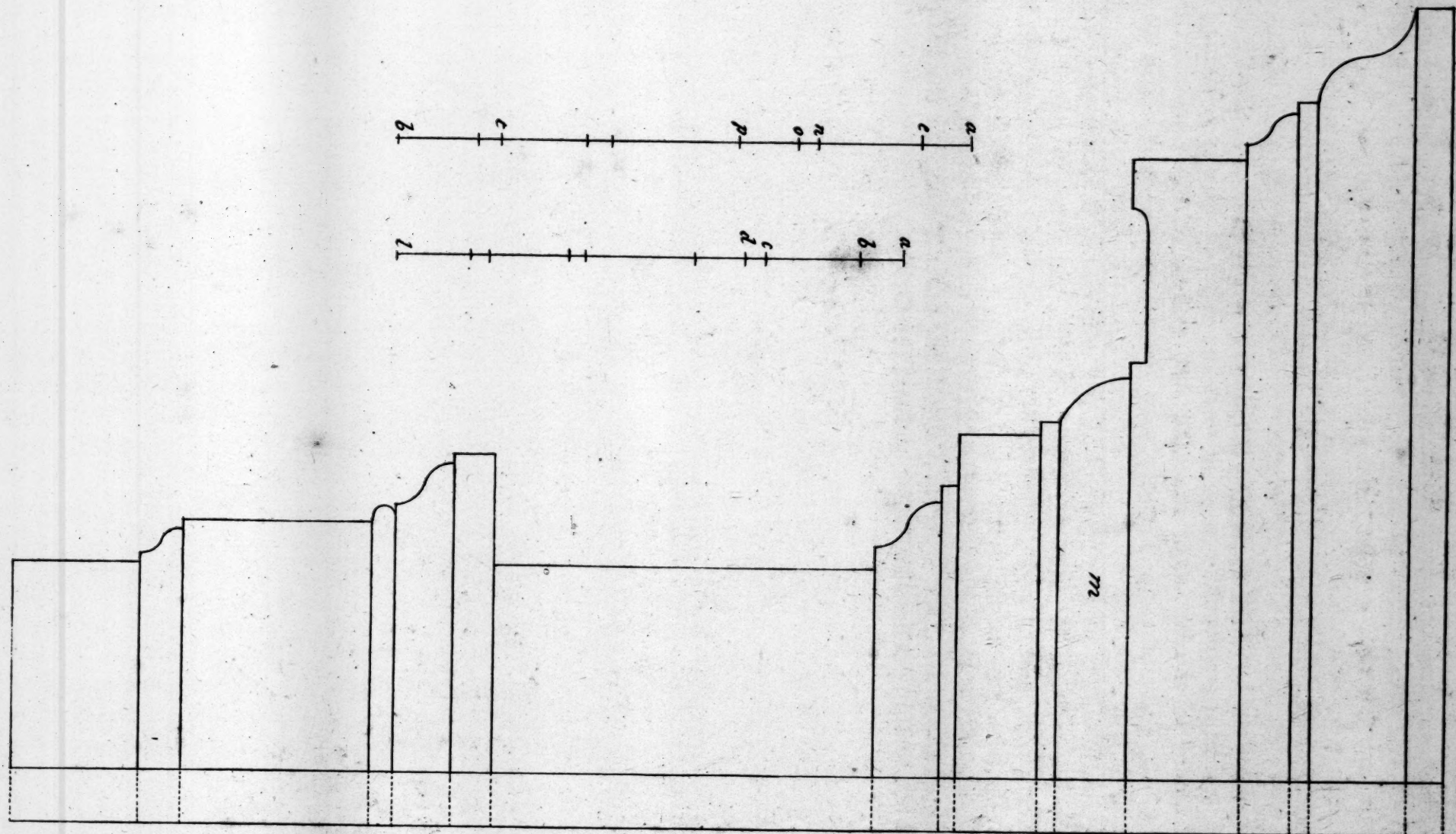


Pl. 37.









OPERATION XXXVI.

To form a Profile with a lesser quantity of Members.

AS it sometimes happens that a Profile is wanted, with a greater or lesser quantity of Members, either to beautify or make it more solid; so it is proper to shew how any Member can be taken away, and the others made proportionably larger.

Therefore to take the Ovolo M from the following Cornice; first draw the Line AL, upon which transfer all the Members (the Ovolo excepted) of the said Cornice; secondly, draw the Line AB as long as the Cornice with the Ovolo; thirdly, take the Line AL and fit it transversally to 9, 9, or to any other Number you please; when the Instrument is thus set, take the Line AB, and see where it transversally fits, suppose to 10, 10, and 3, 3; fourthly, take the distance LB with a Pair of Compasses, and fit it transversally to 9, 9, and then take the transversal Space 10, 10, and 3, 3, with which fix one Point of your Compasses at B in the other Line, to mark the Intersection E with the other; fifthly, take the distance LC with a Pair of Compasses, and fit it also transversally to 9, 9; when the Instrument is thus set, take the same transversal Space 10, 10, and 3, 3, with which fix one Point of your Compasses at B, to mark the Intersection N with the other; proceed in the same manner throughout the Operation for all the other Points, for the Heights of all the Members proportionably larger without the Ovolo.

OF

OF THE

CORINTHIAN ORDER.

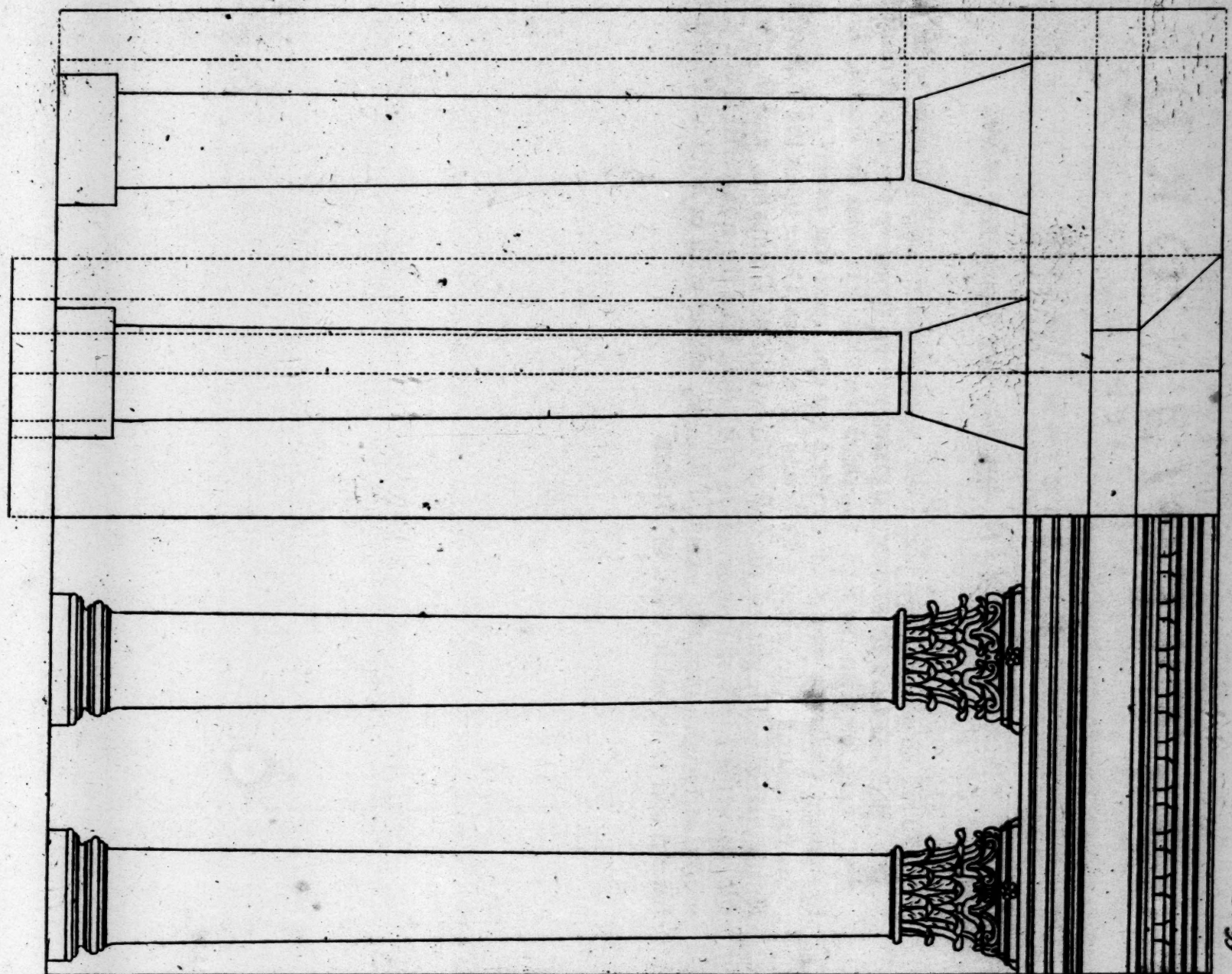
OPERATION XXXVII.

To place the Orders the one upon the other.

THE Orders that go plac'd one upon another, ought always to be a sixth part less than those they are placed upon; therefore the second must be one sixth less than the first, the third one sixth less than the second, and so on to as many Orders as you please to place the one upon the other.

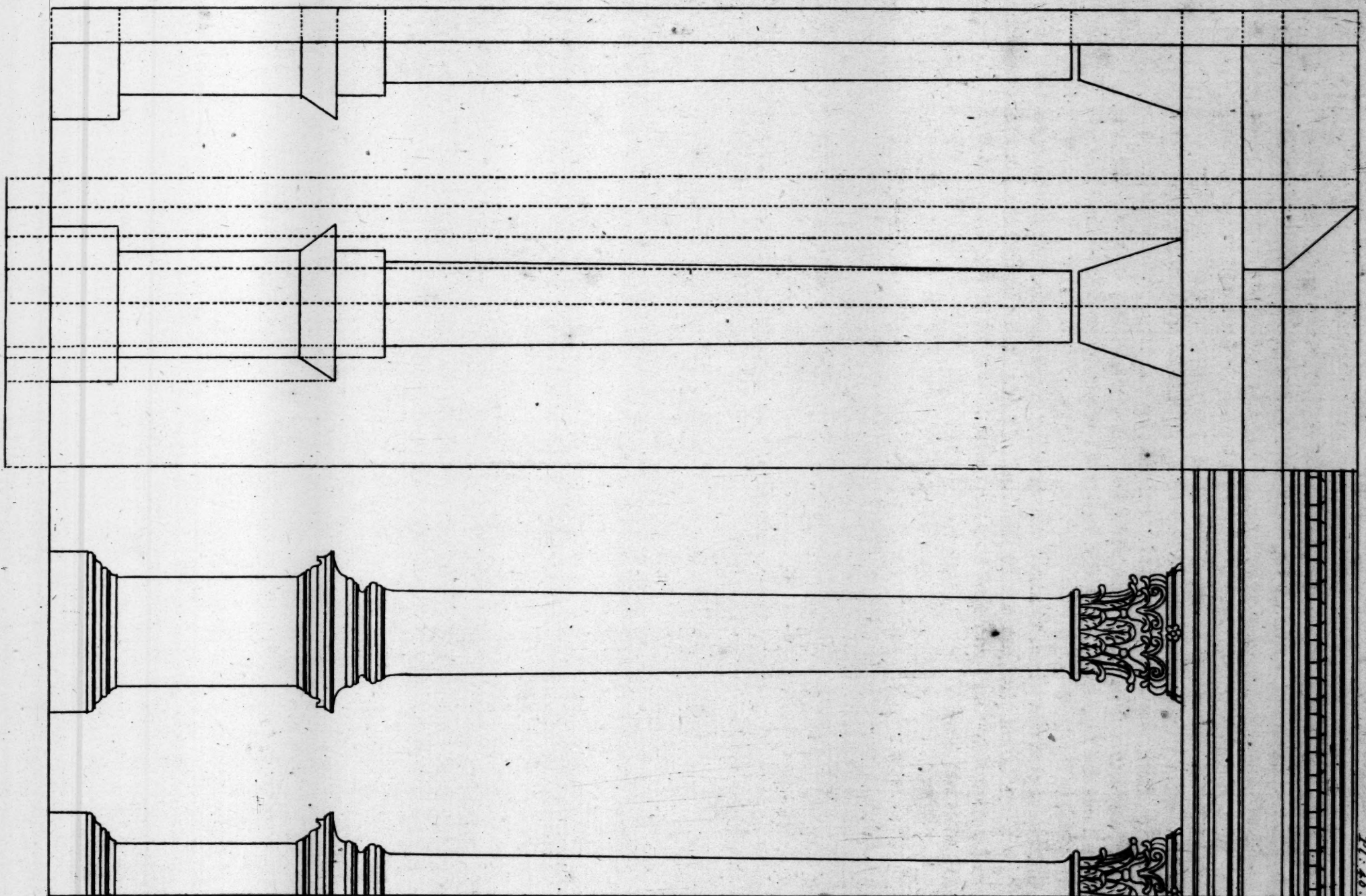
As for Example, to place a Colonnade of another Order upon the following Colonnade; take the Height of the first with a Pair of Compasses, and fit it transversally upon the Lines of Proportion to 6, 6; then take the transversal Space 5, 5, and with that Height form the second Colonnade, either with or without Pedestals: the same is also to be understood of Arches.

OPERATION









OPERATION XXXVIII.

To form the Orders by any given Proportions.

TO form a Colonnade or an Arch by one form'd with Proportions different from those divided upon the Limb of the Instrument, make use only of the Lines of Proportion upon the Legs of the Sector; as the Divisions upon the Limb are useless, and cannot serve to form another greater or less by the same Proportions.

Therefore if you would form a Colonnade, greater or less, by the following Colonnade, or any other that is form'd by Proportions different from those upon the said Instrument; take the Height of the given Colonnade, and fit it transversally to 12, 12, or any other Number; then take the Height of that requir'd, and see where it transversally fits, suppose to 15, 15, with which Numbers form the Colonnade as follows:

Take the Height of the given Cornice with a Pair of Compasses, fit it transversally to 12, 12, and then take the transversal Space 15, 15, which gives the Height of the Cornice requir'd: the same is to be done with all the other Parts and Members to compleat the whole.

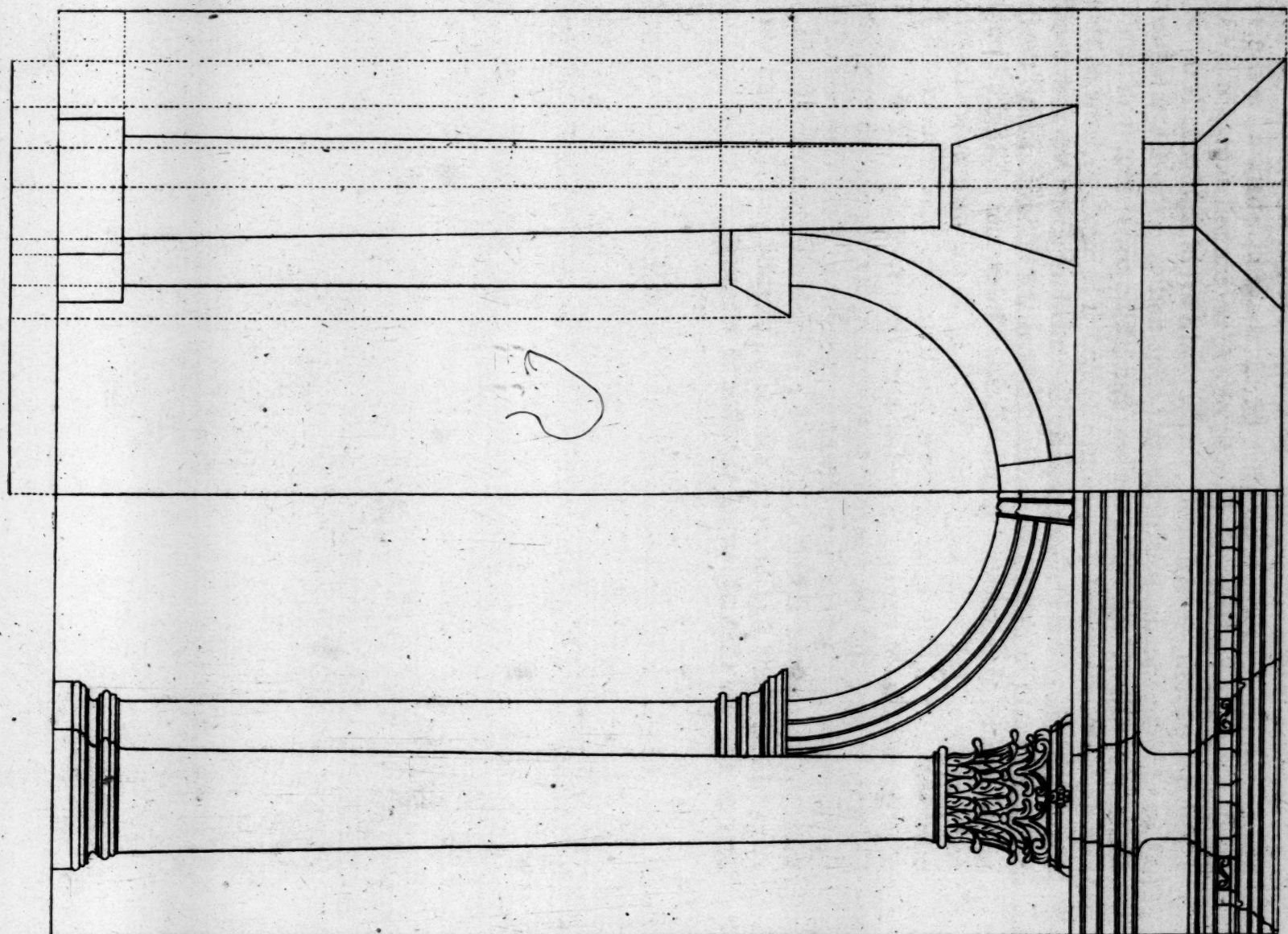
M**OPERATION**

OPERATION XXXIX.

To form the Capital to any given Column without a Capital.

THAT every one may see how this Instrument can solve any difficulty that may be proposed, I will here teach to form a Capital or a Base proportional to any given Column that wants either Capital or Base.

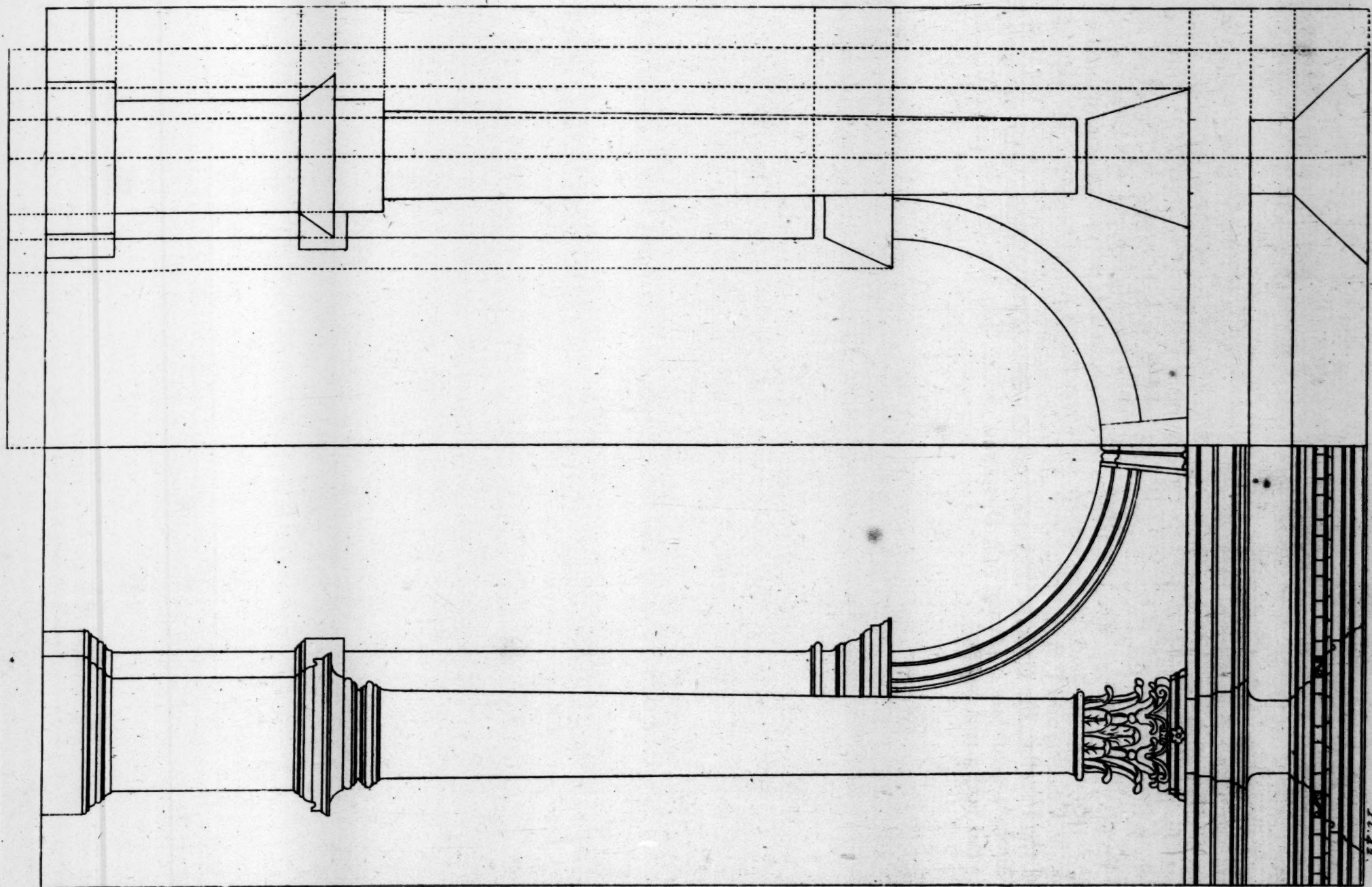
Therefore measure the given Shaft (the Height of which we will suppose 18 Foot 10 Inches) to know of what Order the said Shaft is, and give it its proper Capital as follows; take the Height of one of the following Columns, without the Capital, Circure, or Astragal, fit the said Height transversally to 18, 18, and 10, 10, and take the transversal Space 1, 1, and 2, 2, to see whether it fits to the thickness of the Foot of any of the said Columns, if not, you must in the same manner try the other Orders, until you find it to agree to some of them, with little or no difference, for it may properly be called of the Order it comes nearest to; but if it should fit exactly to the thickness of the Foot of any of the following Columns, the Shaft is without doubt of that Order, and its Capital ought to be made accordingly as follows; fasten the fix'd Leg to the fifth Space for the lesser Semidiameters in the fifth Line of the second Interstice upon the second Face, open the other to the end of the said Semidiameter, then take the half of the Width of the Column at top, and see where it transversally fits, suppose to 1, 1, and 5, 5; when that's examin'd, set the Instrument as it ought to form Capitals of this Order, and take the transversal Space 1, 1, and 5, 5, which gives the Height of the Capital proportional to the said Shaft: by the same method you may find out all the Members of the said Capital, or of the Base if wanting.



Pl. 41.







OPERATION XL.

To form a proper Column to any given Capital.

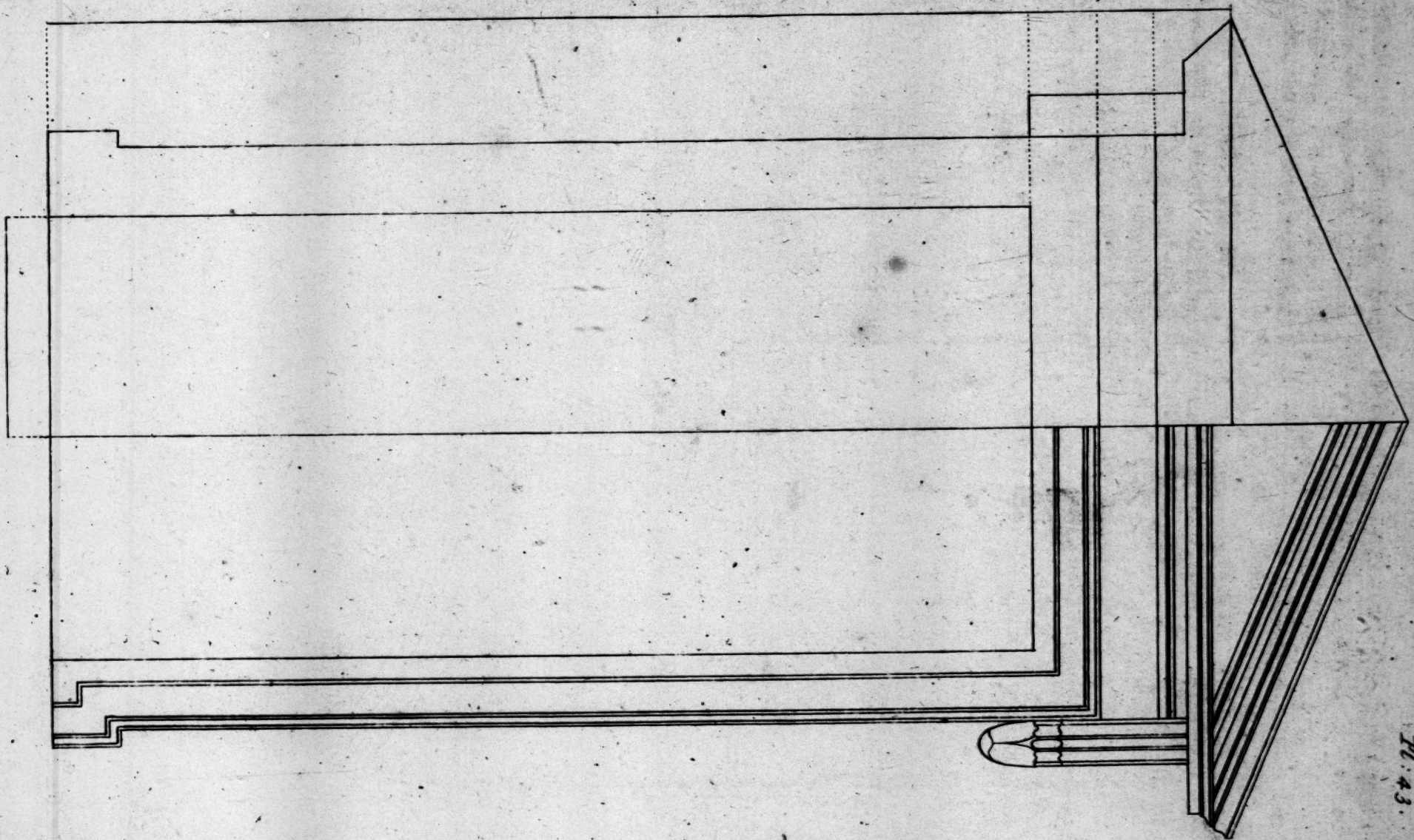
AND for better Instruction, I will here on the contrary give a Capital, and teach how to form a proper Column to the said Capital, which we will suppose of this Order.

Take, in the first place, the Height of one of the following Columns with the Pedestals, and fit it transversally to 14, 14, or any other Number; secondly, take the Height of the Capital with the Cincture and Astragal, and see where it transversally fits upon the Lines of Proportion, suppose to 1, 1, and 4, 4; thirdly, see where the Base of the Pedestal, Shaft, Cimaſium, and Base of the Column fit transversally; fourthly, take the Height of the given Capital, and fit it transversally to 1, 1, and 4, 4, and take the transversal Space 14, 14, which gives the Height of the Column and Pedestal requir'd: the Instrument being thus set, form the Base of the Pedestal, the Dado, Cimaſium, and the Base of the Column with the same Numbers made use of in the first Operation, which will be exactly proportioned to the said given Capital.

OPERATION XL.

By the Opening or Void, to form a proper Cornice to any given Door.

YOU must, in the first place, know of what Order the given Door is, by the Method shewn in the foregoing Operations; but as we suppose it of this Order, let the Instrument as it ought, to form the said Doors, observing to open the moveable Leg to that Point only that gives the Height of the opening; then take the said Height, and see where it transversally fits upon the Lines of Proportion, suppose to 9, 9, and 8, 8; open the Instrument to the other Points, and with the said Numbers form the Cornice: you may also by the same method know the opening or void of any Door by the Cornice.



Pl. 43.

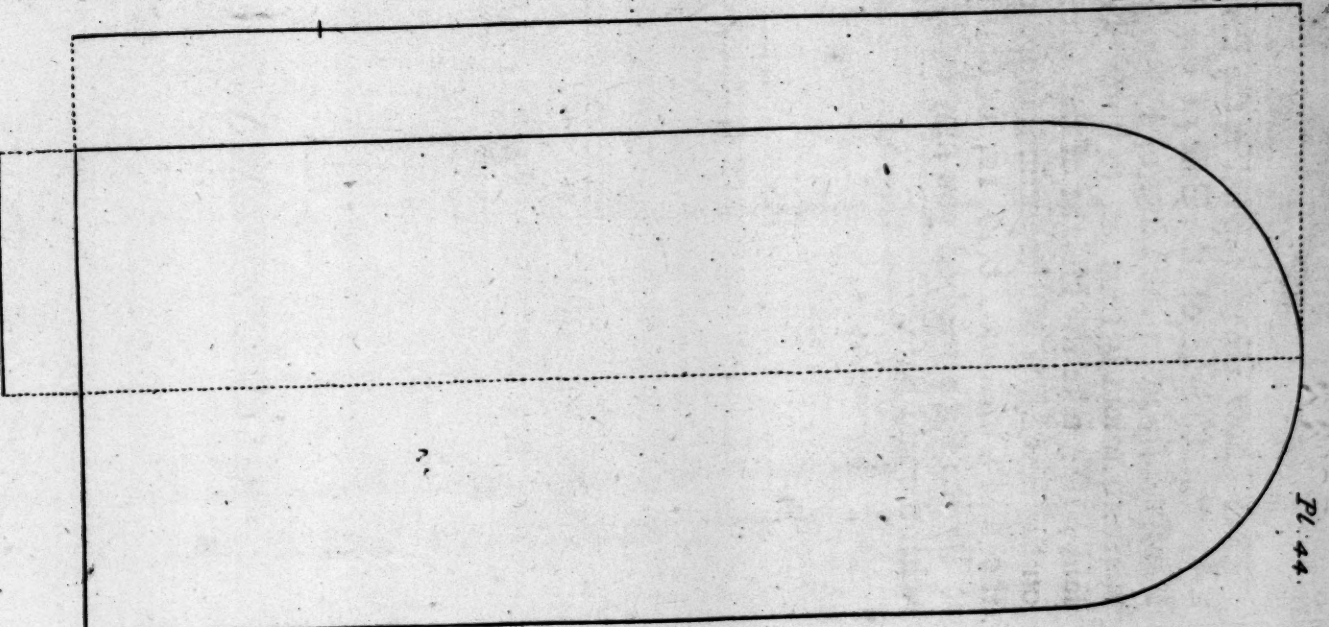


OPERATION XLII.

To form the proper Ornaments belonging any given Niche.

Niches are commonly made plain, but may, in more delicate Orders, be adorned with Architraves, or Colonnades, and Cornices over them, which then are called Tabernacles.

Therefore, to form the several Ornaments belonging to Niches, you must consider, that they are but a kind of Door, and ought to be made by the same Rule; by which you may also form their Architraves and Pilasters suitable to the Order they belong to.



N

OPERATION

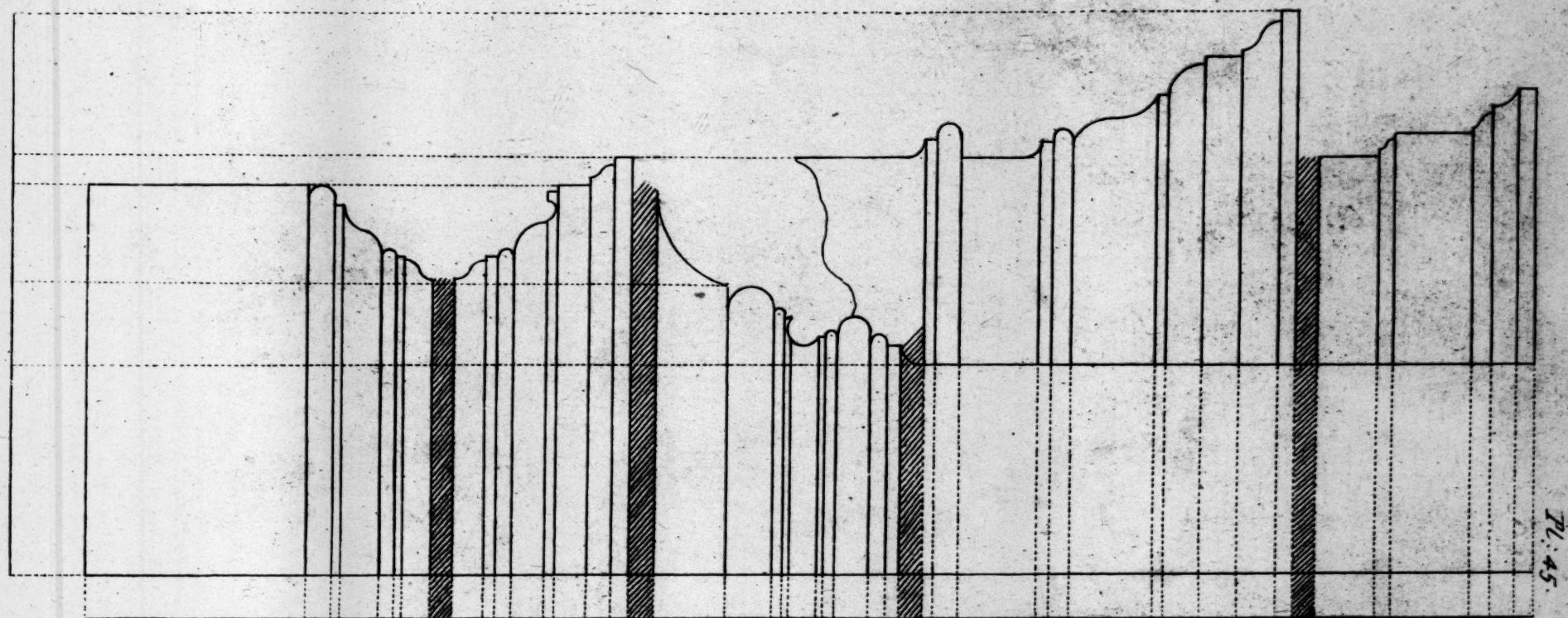
OPERATION XLIII.

To know what Proportion the Parts of the Orders have one with another.

TO know what proportion the Parts of the Orders have one with another, take the Height of the Base of the following Pedestal, or any other part, fit it transversally upon the Lines of Proportion to 12, 12, or any other Number; when the Instrument is thus set, to know what Proportion the Cimafum has with the said Base; take the Height of the Cimafum, and see where it transversally fits upon the said Lines of Proportion, suppose to 6, 6, which gives the just Proportion of the said Cimafum, 6 to 12, or half the Base.

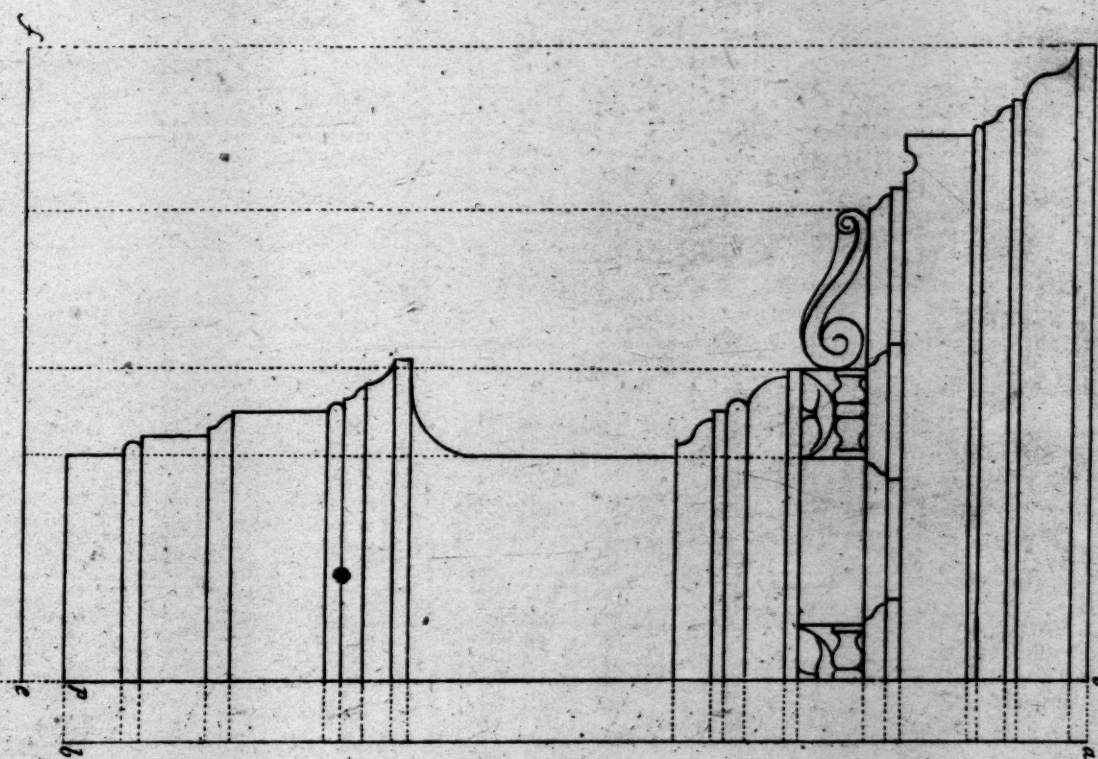
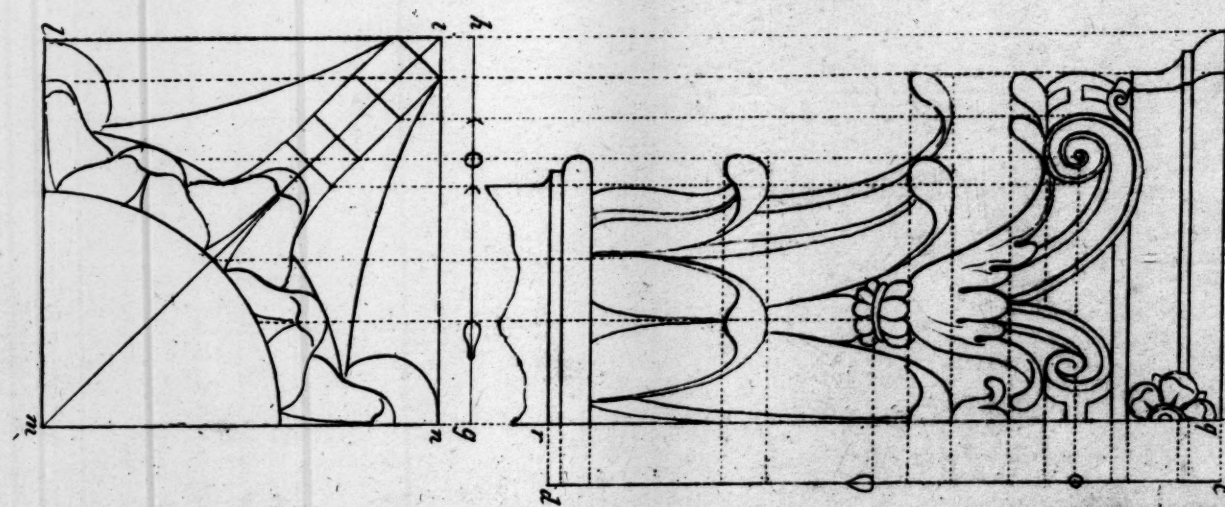
By the same method you may easily know what Proportion any other part bears with the said Base.











Pl. 46.

OPERATION XLIV.

An Observation upon the Corinthian Capital.

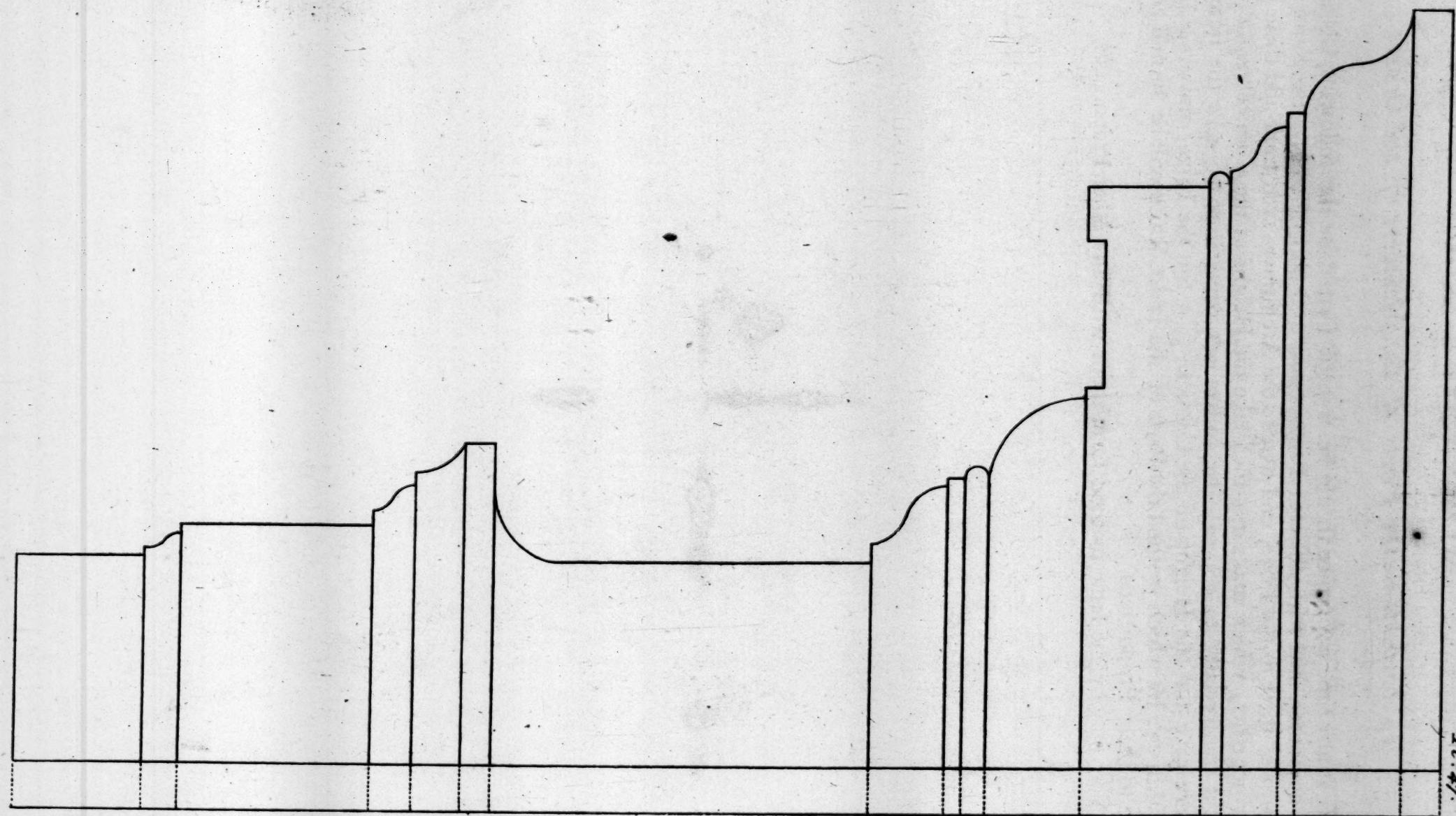
AS there is no difference betwixt this and the *Composite* Capital, excepting the *Clavicoli* and Volutes; so you must observe the same method, when all the Points for the Heights and Widths are mark'd, which, for the most part, intersect upon the Spirals of the greater Volutes, and give the Projecture of the Leaves, as may be observ'd by the Perpendiculars, and ought to be first drawn with a black Lead Pencil, that they may the more easily be rubb'd out in case of error, causing likewise the Perpendiculars to fall in the Square NILM, to form its Plan,

OPERATION XLV.

To proportion the Parts of the Members of the Orders.

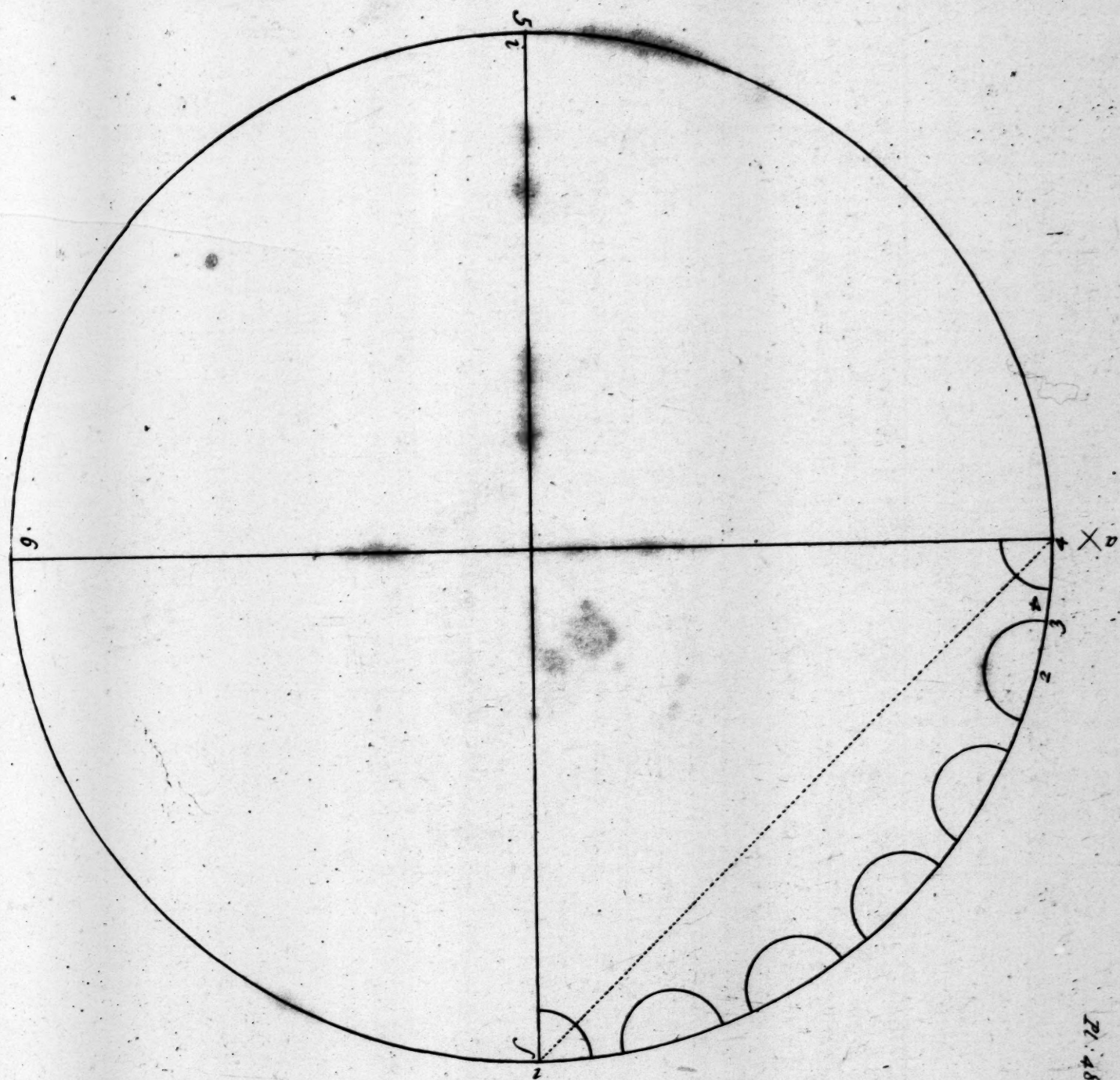
IF at any time a Cornice should be wanted form'd by the following Cornice or any other, but with different Proportions, and obliged to give five Parts to the Cornice, three to the Frize, and four to the Architrave; you must add these Numbers together, which make 12, then take the Height of the Cornice requir'd, and fit it transversally to 12, 12; the Instrument being thus set, take the transversal Space 5, 5 for the Height of the Cornice, 3, 3 for the Frize, and 4, 4 for the Architrave, by which method the Parts of the said Cornice will be form'd according to these Proportions.

You may by the same method form them with any other Proportions.









OF THE

ORNAMENTS of the ORDERS.

OPERATION XLVI.

To flute Columns.

AS I have in the foregoing Operations shewn how to measure and proportion the Orders, &c. so I shall now teach how to flute the Columns with the usual Number of 24 *per* Column; therefore make a Circle as large as you please, representing the thickness of the Foot of the Column, and divide it into four equal Parts as follows;

First, draw the Line 1 5 through the Center of the said Circle, to divide it into two equal Parts; secondly, place one Point of your Compasses at 8, and stretch the other to A to make a small Mark; fourthly, place one Point of the Compasses at 1 to mark the Intersection A, from which draw the Line 4 6 through the Center to divide the Circle into four equal Parts; fifthly, fasten the fix'd Leg to the beginning of the first Line in the fourth, and last Interstice upon the second Face, open the other to the end of the Division, and take the Distance 1 4 with a Pair of Compasses, to see where it transversally fits upon the Lines of Proportion, suppose to 4, 4, and 10, 10; then fasten the moveable Leg to the next Point, and take the transversal Space 4, 4, and 10, 10, with which place one Point of the Compasses at 1 to mark the Intersection 3 with the other; fasten the moveable Leg to the next Point, and also take the transversal Space 4, 4, and 10, 10, with which place one Point of the Compasses at 1 to mark the Intersection 2, the end of the sixth Part of this quarter Circle 4 1; now take the distance 2 4, divide it with the Compasses into two Parts; and with the distance 2 3 form the half Circle, which distance also serves to make the others.

The same must be done in the other quarters to mark all the Flutes, to the Number of 24.

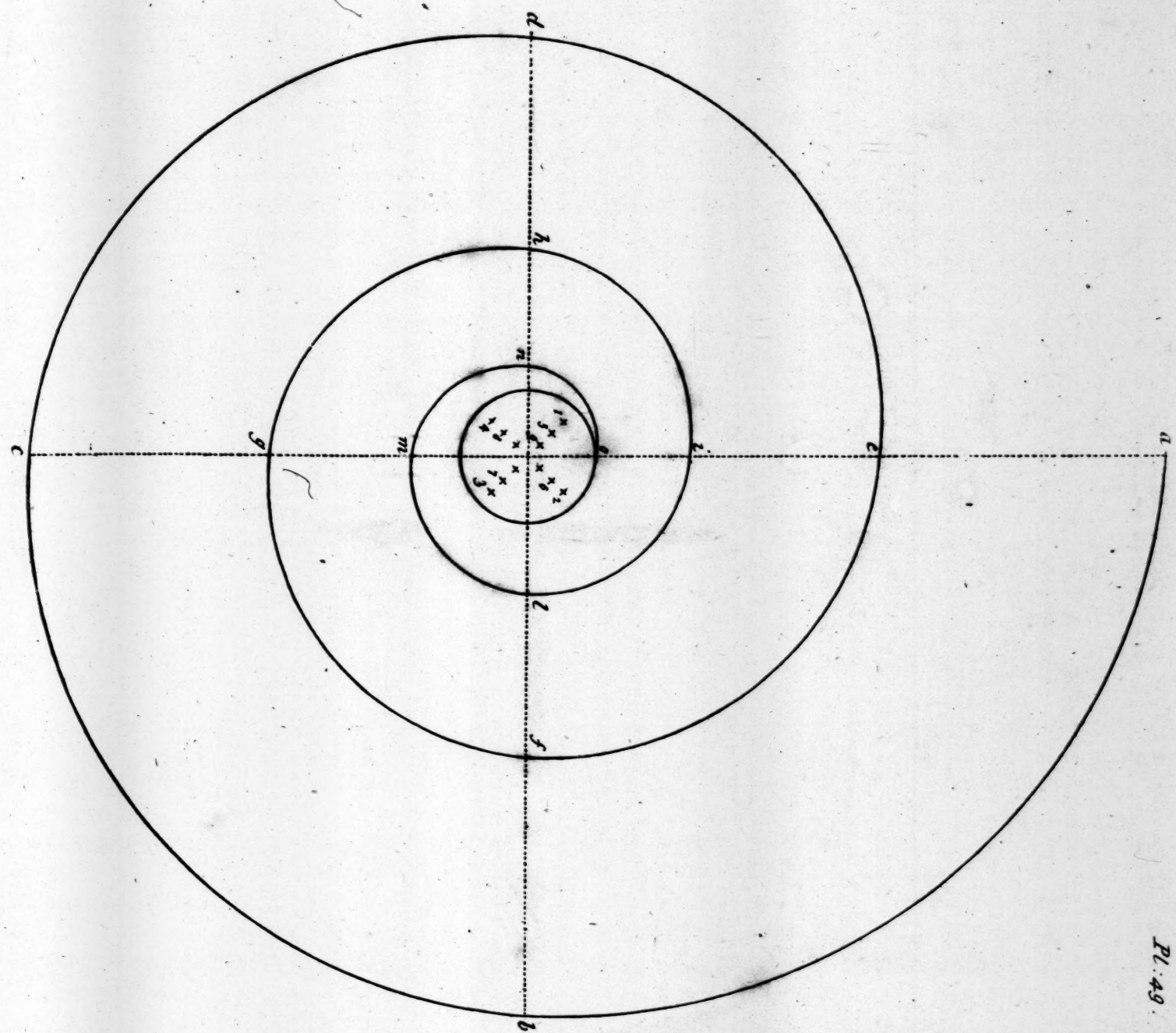
OPERATION XLVII.

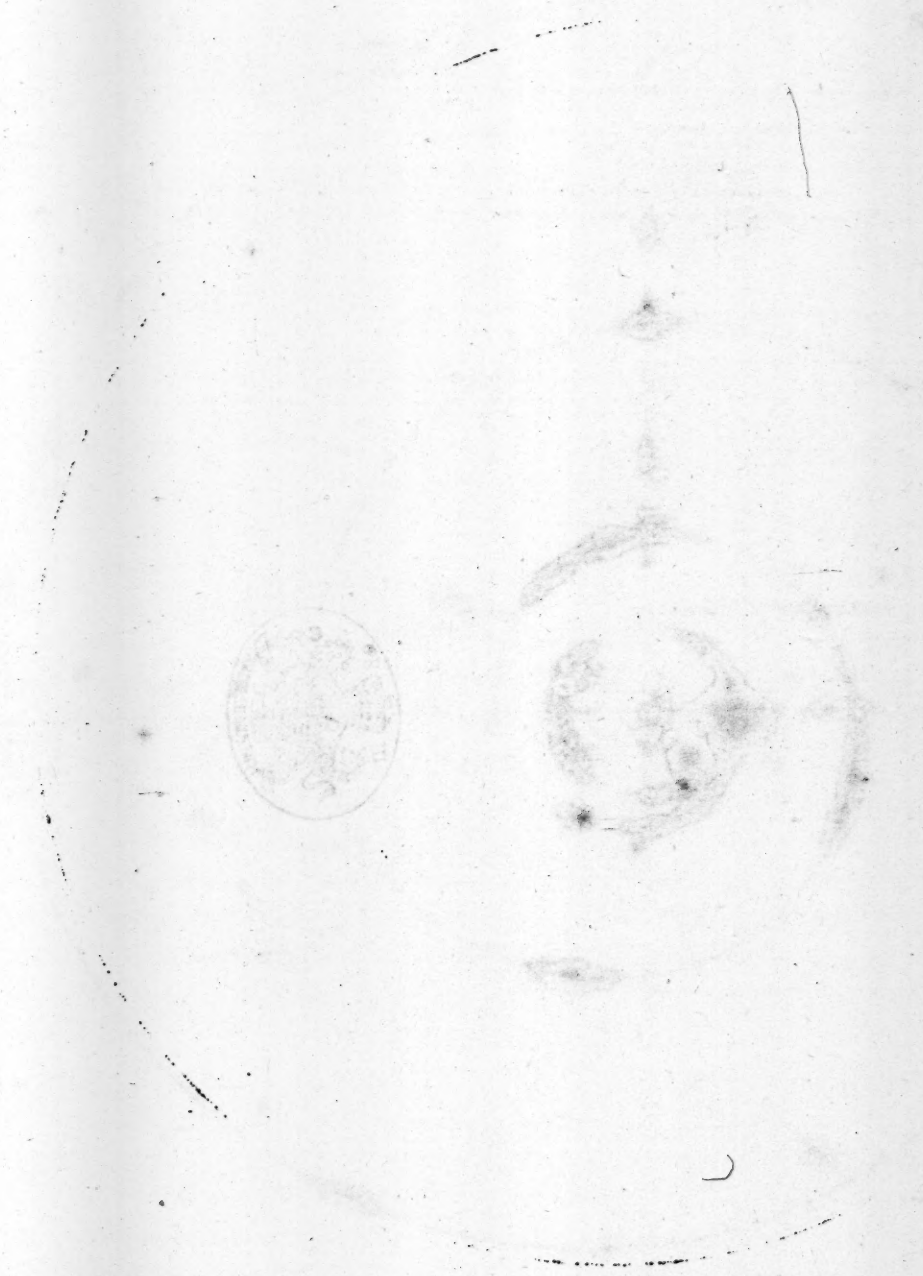
To form the Voluta.

TO form the Voluta, draw two Lines in the middle of the Leaf, which intersect one another at Rectangles, as AC and DB, after which fasten the fix'd Leg to the beginning of the second Line in the fourth Interstice, upon the second Face mark'd with the Letter V; open the other to the end of the Division, then take the Space between the Point of Intersection of the two Lines and E with a Pair of Compasses (if the Voluta is requir'd of that Bigness) and see where it transversally fits upon the Lines of Proportion, suppose to 4, 4, and 3, 3; and as in this Operation two Numbers are required, the first diametral and the second diagonal, I thought it convenient to distinguish the latter from the former by Points mark'd out of the Order of the Lines; therefore take the Diametrals first, by fastening the moveable Leg to the second Point not countermark'd, and take the said transversal Space 4, 4, and 3, 3, with which place one Point of your Compasses at the Point of Intersection of the two Lines, which is also the Center of the Voluta, to mark the Intersection B with the other, for the second diminishing or diametral Point; fasten the moveable Leg to all the other Points not countermark'd, and to every Point take the said transversal Space 4, 4, and 3, 3, with which place one Foot of the Compasses in the Center to mark the following Intersections C, D, E, F, G, H, I, L, M, N, and O, for the eye of the Voluta.

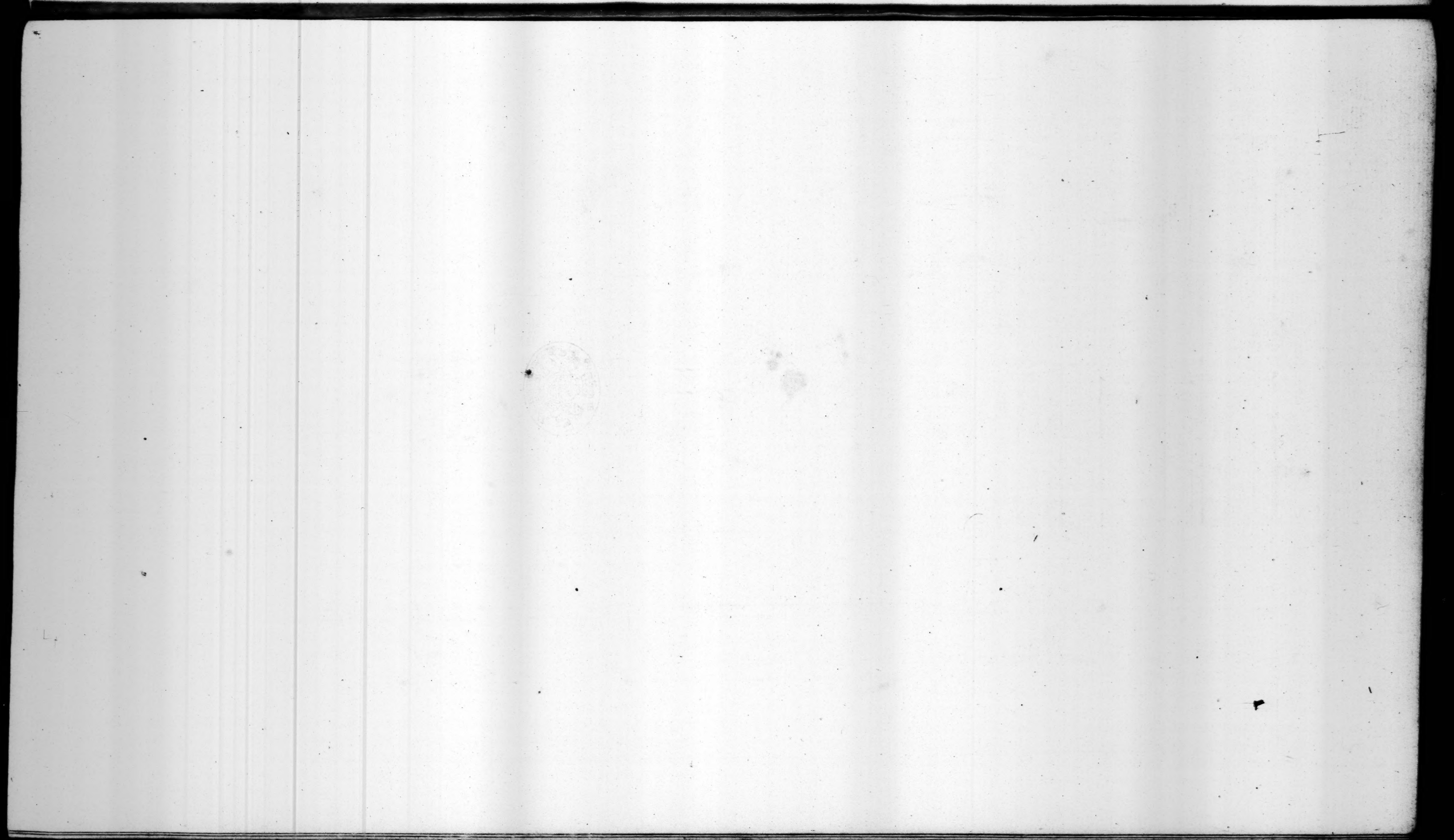
Turn back again with the moveable Leg to take the diagonal Points, and fasten it to the first Point that is countermark'd, to take the transversal Space 4, 4, and 3, 3, with which place one Point of your Compasses at A, and then at B, to mark the little Cross 1 in the Eye, which is the Center, to mark that part of a Circle AB, fasten the moveable Leg to the next diagonal Point, to take the said transversal Space 4, 4, and 3, 3, with which place one Point of your Compasses at B, and then at C, to mark the little Cross 2, which you will make your second Center, to mark the Portion B C; thus continue the Operation, and fasten the moveable Leg to all the other diagonal Points, to mark the twelve Centers to compleat the Voluta, which serves chiefly to form Capitals and Scrolls.

OPERATION

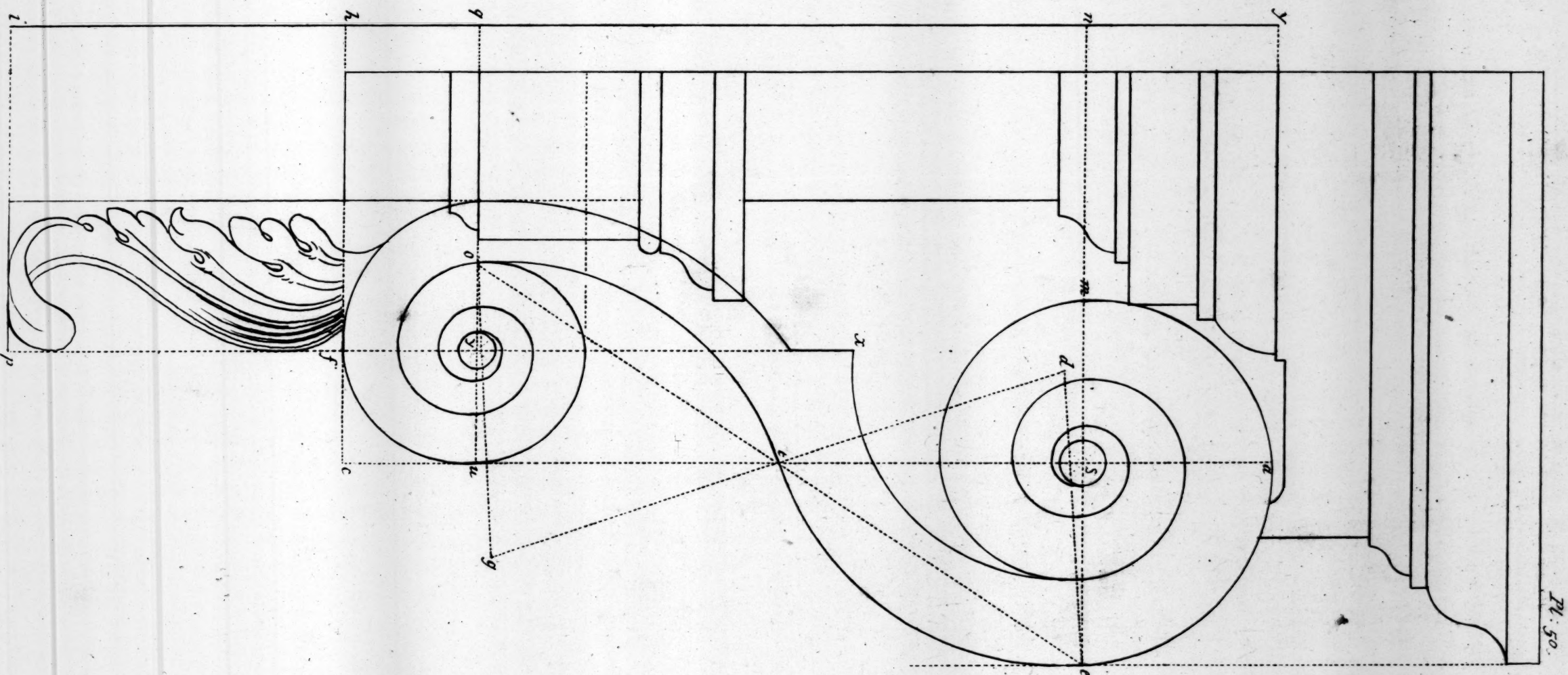
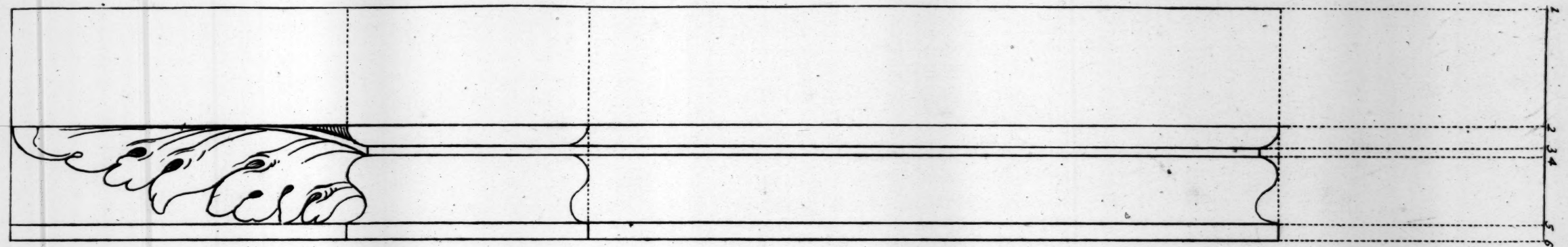




75



5



Pl. 50.

OPERATION XLVIII.

To form Scrolls and apply them to Cornices.

AS Scrolls, when made in Proportion, commonly serve to increase the Ornaments of Doors and Windows, so it is proper to shew how they are to be form'd and apply'd to Cornices.

Therefore, when the following Cornice is form'd, you must, in the first place, fasten the fix'd Leg to the beginning of the third Line in the fourth Interstice upon the second Face, *i. e.* to V, of the perpendicular Line VI, open the other to H, the end of the Voluta and beginning of the Leaf; and secondly, as Scrolls must begin under the Corona and end at the Architrave, or to the height of the opening or void of the Door; take the distance AC with a Pair of Compasses, to see where it transversally fits upon the Lines of Proportion, suppose to 9, 9, and 8, 8, with which place one Point of your Compasses at A to mark the Intersection V and S, from which draw the Lines SCM and YV and O, and with the distance AS and VC, or YF, which describes the second diminishing of the Voluta, form the said Voluta in the following manner.

Set the Instrument as it ought to form the Voluta, observing to fasten the moveable Leg to the second diametral Point, and then take the distance AS with a Pair of Compasses, to see where it transversally fits upon the Lines of Proportion, suppose 1, 1, and 8, 8, with which form the upper Voluta, making it come directly to the Projecture of the Cornice, which may very easily be done in placing the center S more back or forward: and as the distance AS serv'd to form the upper Voluta, so YF serves for the second diminishing; therefore continue the Operation as before to form the lesser Voluta, making its beginning pass directly upon the second Fascia of the Architrave, by which method the diminishing V will fall perpendicularly under the upper Voluta; then divide VS into two equal parts at T, and take the quantity TV, and place one Point of your Compasses at T, and then at O, to mark the Intersection G with the other, and make that your Center to draw that part of a Circle OT; with this same opening, put one Point of the Compasses at E, and then at T, and make D your Center to draw the Portion CT (with the same Center you must mark also the thickness) fasten the moveable Leg to the end of the Division, and take the transversal Space 9, 9, and 8, 8, which gives the Height of the Leaf: for the thickness of the said Scrol, fasten the fix'd Leg to the end of the Division for Scrolls, *i. e.* to 1 of the horizontal 1 6, mark'd near the upper part of the Ovolo of the Cornice; open the other to 6, then slide the moveable Leg to 5, 4, 3, 2, and to every Point take the transversal Space 9, 9, and 8, 8, for half its Width; the other part may be measur'd with a Pair of Compasses only, to compleat the Scrol, just as that you see fitted to the Cornice.

OPERATION

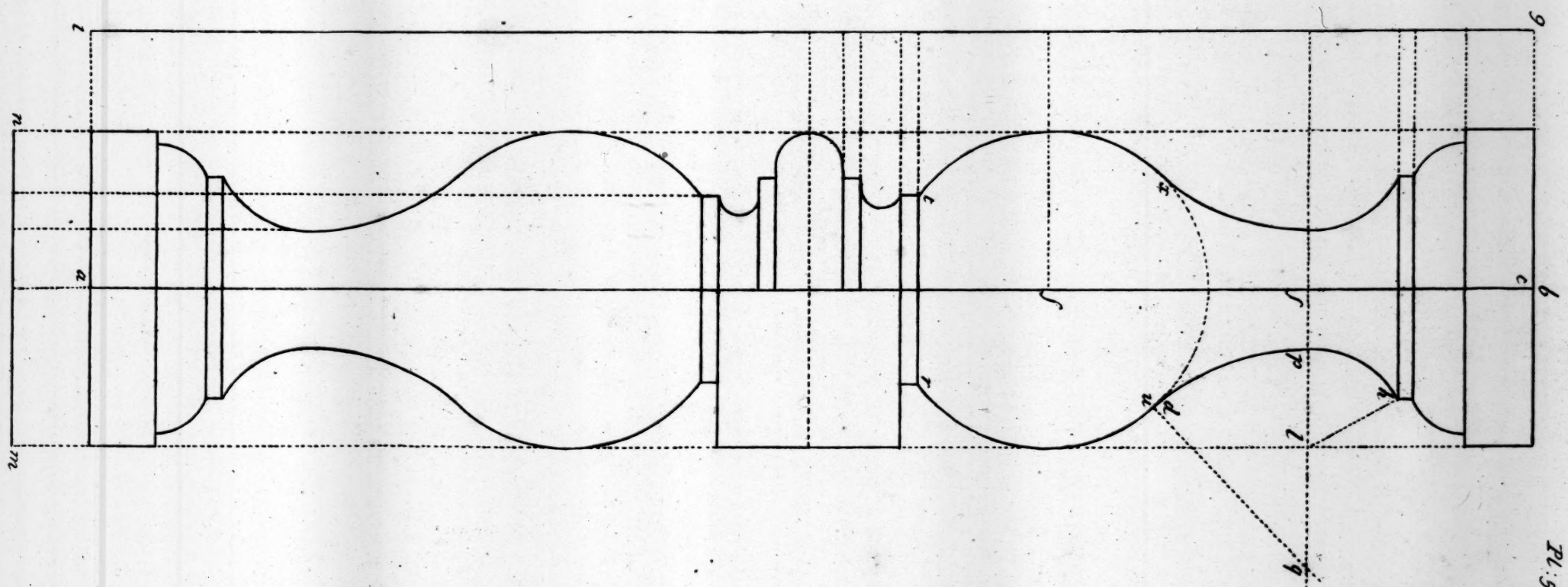
OPERATION XLIX.

To form Balusters or Columns.

TO form Balusters, fasten the fix'd Leg to 1 of the perpendicular Line 1 9, representing the beginning of the fourth Line in the fourth Interstice upon the second Face, open the other to 9, the end of the said Space; take the quantity AB (supposing that half the Baluster) to see where it transversally fits upon the Lines of Proportion, and with that transversal Space mark all the Heights with proper Lines.

For the Widths, slide the fix'd Leg above the Space for the Heights, and there fasten the said Leg to M, open the other to N, and with the same transversal Space, that serv'd to mark the Heights, mark also the Widths, making S your Center to form the Circle TXVR; then take the quantity SC with a Pair of Compasses, with which place one Point at P, the other at Q, and there mark your Center to draw the Line round PD; make also L your Center to enclose PH to form the Neck of the Baluster: the same is to be done on the other side to complete the whole.

F I N I S.



Pl. 51.



